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Address

THE MYELINS AND POTENTIAL FLUID CRYSTALLINE BODIES OF THE ORGANISM.*

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MONTREAL.

The polarizing microscope, simple as it is with its Nicol's prisms—the two pieces of Iceland spar which can be turned at various angles one to the other—has not been a popular instrument in medical science. I take it that my own experience is that of other medical men. I can remember well a genial and enthusiastic colleague inviting me years ago to spend the evening with him, when he showed me slide after slide of various substances exhibiting exquisite figures under the Nicol's prisms. I know I thought the results too pretty to be useful—that the instrument was peculiarly well adapted for the use of members of microscopic societies and other amateurs of microscopy, but for the physician and pathologist it was at most a toy. I would here recant this early error and would acknowledge humbly that within certain limits the polarizing microscope shows itself a most valuable aid in the detection and recognition of the nature of a class of substances within the tissues which are difficult, nay almost impossible, to recognize by other means.

If you take a section of the fresh adrenal of man or of one of the animals of the laboratory and examine the cortex under the ordinary microscope, the parenchyma cells have, as is well known, the appearance of being in the condition of advanced fatty degeneration—the cell substance, that is, is seen to be densely packed with small fatty globules. But, as shown by Kaiserling and Orgler, examine that section between the Nicol's prisms and sundry of the globules exhibit an exquisite black cross between four illuminated sectors. Smear a little of the juice of the fresh adrenal on a slide and these can be examined more narrowly. Under the ordinary lens that juice is found filled with pure fatty globules varying in size; with the crossed Nicol's prisms a few of these now stand out as illuminated crosses. Turn the prism round and what had been crosses appear indistinguishable from the abundant surrounding fatty globules (Fig. 1†).

Here clearly we have not to do with ordinary fats. Neutral fats and fatty acids under no condition afford these characteristic doubly refractive globules. We are dealing with some other substance, a substance apparently acted on by water, for the addition of water to the juice causes the crosses to fade out; they disappear also if the preparation be desiccated, as again rapidly if it be treated with absolute alcohol. By that apparently they are dissolved, for treat an adrenal with alcohol and now evaporate that alcohol and at a certain stage these doubly refractive globules make their appearance to disappear again as the preparation dries up; while, further, where an adrenal has been hardened in formalin minute rod-like crystals take the place of these globules.

The adrenal is far from being the only organ that affords them, although it is the organ which in the normal state affords them in the greatest abundance without previous treatment of any kind. A common morbid state that often yields them in great abundance is atheroma of the aorta—one has but to scrape off a little of the broken-down material in an atheromatous plaque to find again this association of isotropous fatty and doubly refractive anisotropous globules. Or, again, pound up the liver or the spleen or the kidney in absolute alcohol, leave for a few hours, put a drop or two of the fluid on a slide and as the alcohol evaporates these remarkable bodies make their appearance in relatively large numbers (Fig. 2†).

WHAT ARE THEY AND WHAT DO THEY SIGNIFY?

The answer to that question is rather a long story, and a round-about-one at that; nor is it in my power—or any one's—to tell you its conclusion. The most I can hope to do is to interest you in the story, to show you into what by-paths of science it leads and to set you guessing, and I hope some of you more than guessing, as to what is the conclusion thereof. For the matter appears to open up not a few lines of profitable investigation. I may, it is true, give you immediately an apparent answer. I can, that is, give these bodies a name. I may call them "myelin globules," and state that they are the condition assumed by myelin at a certain phase or under certain conditions. I question, though, whether this will bring much comfort. For what is myelin?

The remarkable fact about myelin is that it has been known for more than fifty years; that within a few years of its recognition by Virchow, in 1854, it had been determined that bodies of the nature of myelin could be gained from practically every organ of the body, and this often in large amounts, and that, though this is the case, though the pains of pathologists brought myelin into the world and pathologists mothered, or fathered, it, though there is quite an extensive literature on the subject, it is rarely mentioned in polite medical society. Your writers of text-books on physiology and pathology treat it much as the priest and Levite treated the man who fell among thieves and they studiously pass by on the other side without apparent recognition of its existence. This possibly because, had they recognized its existence, they could but confess their ignorance why it was there and what its function in the economy. And it has to be confessed that myelin has shown itself a most elusive substance.

* A lecture delivered before the Harvey Society, New York, Dec. 1, 1906.

† The illustrations appear on page 480.

If one takes fresh medullated nerve or brain substance and teases it out in water, the marrowy matter forms into drops and masses of irregular rounded contour, and as one examines these they become altered in shape, throwing out blunt rounded processes with a double contour. We are clearly not dealing with ordinary fats. Early in the last century Berzelius observed that the cerebrin which he extracted from brain matter gave similar bizarre forms; so, too, Drummond, in 1852, noted a like phenomenon with the alcoholic extract of brain matter. I find, indeed, that if fresh brain matter be placed in absolute alcohol for twenty-four hours the development of these bodies and processes becomes greatly exaggerated. Place a fragment under a coverslip and surround with water and long processes are shot out from the mass, curving in a most serpentine and life-like manner, and from them double contoured droplets become detached. Virchow, in 1854, called attention to the fact that by alcoholic extraction similar bodies could be gained from other tissues: from the blood, from yolk of egg, from the ovaries of calves, from the normal spleen, goitrous thyroid and diseased lungs. And, as in their physical properties they resembled brain marrow, Virchow gave these the class name of myelin. Whether he was dealing with one or with several substances, he could not determine; he was inclined to the view that, if not a single substance, he dealt with a group which chemically were as closely allied as the various albumins, and Virchow summed up their properties as follows:

1. When brought into contact with water they swell up and in doing so exhibit a characteristic morphology, being seen under the microscope to develop processes of irregular and often bizarre form, globular, rod-like, or curved on themselves and variously distorted exhibiting, as already noted, a double contour, undergoing changes of shape while under examination.

2. They are easily soluble in hot alcohol, becoming, in part, precipitated on cooling.

3. They dissolve rapidly in ether, chloroform and turpentine.

4. They are acted on but slowly and to a slight extent by weak acids and alkalies.

5. Under the action of strong alkalies they shrink, with eventual loss of their characteristic properties.

6. Under the action of strong acids they first swell greatly and then undergo dissolution.

Now, whether recognizable immediately in the tissues or cells or cell débris so soon as water is added, or recognizable only after an alcoholic extract has been made of the tissues and such extract treated with water, bodies conforming to these postulates have been found distributed through the organism. And as a class they possess, with the limitations already laid down, the power of double refraction.

The history of the recognition of this last property affords an interesting example of the way in which valuable observations may, for long years, wholly disappear from remembrance, and that because they have been originally given to the world in the pages of an obscure journal. In 1857, if I mistake not, a society was established in Germany for the advancement of medical science, and the official organ of that association was distributed primarily, and it would seem almost entirely, among the members of the association. That journal, like the association, had but a brief existence. In its thirty-first number, Geheimrath Dr. Mettenheimer published his observations on myelin, noting its power of double refraction. The observations were so important that the elder Beneke, in 1862, reprinted the article in its entirety. But this happened in a monograph whose title, "The Presence, Distribution and Formation of the Constituents of Bile," did not in the least suggest that it was concerned largely with this subject of myelin. Thus it is that, reviewing the literature for the next forty-four years, I have failed to come across a single reference to Mettenheimer's work, while Beneke's, after a year or two, appears similarly to have passed into oblivion until quite recently, when, with filial piety, the younger Beneke drew renewed attention to his father's work. In the meantime workers in different branches of biologic science made, as they thought, the independent discovery of this property of myelin. Apathy, in 1889-90, working on the histology of the nervous system, G. Quincke, the physicist, in 1894, Müller of Marburg in 1898 and Kaiserling and Orgler of Berlin, later in the same year; and of these, from their writings, each seems to have been supremely ignorant that any one had been before them in making the observation that myelin is doubly refractive.

That all substances affording myelin forms can be shown to be doubly refractive I greatly doubt, or, more accurately, I would say that there are substances, such as the lecithins, capable of affording myelin forms of the simplest type with which so far I have been unable to gain doubly refractive globules.[1] I shall have something to say later regarding these apparent exceptions.

I have here tabulated the distribution of Virchow's myelin in the organism as it has been recorded by various observers.

TABLE A.—SHOWING THE DISTRIBUTION OF MYELIN SUBSTANCES IN THE ORGANISM.

1. INTRACELLULAR MYELIN GLOBULES:	
A. *Physiologic*, or associated with normal regressive processes:	
Cells of suprarenal cortex	Kaiserling and Orgler.
Granular cells of corpora lutea	Kaiserling and Orgler.
Cells of thymus gland	Kaiserling and Orgler.
Cells of mucous membrane of gall bladder	Aschoff.
B. *Pathologic:*	
Aortic endothelium, fatty patches	Aschoff.
Atheromatous patches of aorta	Mettenheimer.
Lungs: Alveolar epithelium of new-born	Hochheim.
Bronchial epithelium	Schmidt.
Diseased lung tissue	Mettenheimer.
Kidney: Epithelium in fatty degeneration	Albrecht, Löhlein.
Epithelium after arterial ligation	Albrecht.
Crystalline lens, cataract	Mettenheimer.
Tumors, cells of many cancers and sarcomas	Kaiserling and Orgler.
C. *Autolytic:*	
Lung, alveolar epithelium	Albrecht, Hochheim.
Kidney and liver cells	Many observers.
Skeletal and heart muscle	Dietrich and Hegel.
Morning sputum (?)	Müller and Schmidt.
2. DIFFUSED MYELIN: (Impure lecithin?).	
Myelin gained from various tissues by digestion with alcohol; brain and nerve tissue, spleen, liver, egg yolk, blood, mesenteric chyle, pus, etc.	Virchow.
3. MYELIN IN SECRETIONS: (Also gained by alcoholic extraction.)	Virchow.
Bile.	
Contents of small intestine after fatty meal	Beneke.

WITH WHAT ORDER OF SUBSTANCE ARE WE DEALING?

My attention was forcibly directed to this class of substances through certain observations made in my laboratory by Dr. Oskar Klotz. Studying the experimental production of calcareous degeneration, he noted that if

1. Since delivering this address I have found that at least one lecithin (from egg yolk) gives with water exquisite doubly refractive figures, and that after repeated solution in chloroform and precipitation with acetone, a procedure which should remove any dissolved cholesterin. This is in opposition to Beneke's statement that egg lecithin completely purified from cholesterin gives no myelin figures. It is possible that Beneke is correct, but if so the process of separating cholesterin from lecithin must be very difficult.

permeable celloidin capsules, containing oleic acid or neutral fats, be placed in the peritoneal cavity of the rabbit, on removal after a few days the contents give a relatively considerable proportion of calcium salts—salts which had not been there previously, which now are present in definite excess over the normal calcium contents of the rabbit's blood and lymph. The only conclusion to be reached was that in the organism under certain conditions calcium salts may become fixed by fatty substances; in other words, that calcium soaps become formed. From these observations he was led to study, histologically and chemically, areas of pathologic calcification in the organism in order to determine if these afforded indications that the fats play a part in the process of pathologic calcification, and more particularly if there were indications of the presence of soaps as an intermediate stage in the process. He found that outside the body the stain Sudan iii affords a differential staining between neutral fats and soaps, globules of the latter taking on a paler, more yellowish tinge, and that in the zone immediately surrounding areas of active calcareous deposit he could recognize similarly globules taking on the deeper stain of neutral fats, together with others taking on the characteristic tint of soaps.

From these studies Klotz concluded that fats play an active part in the process of calcification: that, first, the affected area undergoes necrobiosis with fatty degeneration; that, next, calcareous soaps become formed, and, finally, that the fatty acid moiety of the compounds becomes replaced by the chemically more powerful phosphoric or carbonic acid, calcium phosphate and calcium carbonate being the end products. The indications were that he had not to deal with a simple calcium soap, but with a soapy compound containing calcium and, as he held, a proteid constituent. These stages could be well followed in that commonest seat of calcareous degeneration, namely, the aortic wall in the course of arteriosclerosis. But now, happening to visit Marburg for other purposes, there Professor Aschoff pointed out to me that Dr. Klotz's description of these fatty globules, which were not fat, but of a soapy nature seen in the atheromatous area, corresponded in many respects with that of the globules seen by him in the arteriosclerotic artery, globules which, as Mettenheimer first showed, and as Torhorst, working in Aschoff's laboratory, had independently determined, are doubly refractive. They are, in short, myelin bodies.

WERE KLOTZ'S SOAPS AND THESE MYELIN BODIES ONE AND THE SAME?

It was to the solution of this question that Aschoff and I directed our attention. We found, in the first place, that the globules in the atheromatous aorta, which under Nicol's prisms were doubly refractive, take on the differential stain with Sudan iii; that Torhorst's myelin and Klotz's soaps are identical. The methods for isolating fats and soaps are still so imperfect and the amount of the doubly refractive material in the atheromatous aorta relatively so small that chemical isolation and study appeared hopeless. All that was left was to study the physical properties of various soaps and lipoid bodies so as to determine which of them approached most nearly in properties to the myelins. Thus it was that I undertook a long series of observations, in association with Professor Aschoff, beginning with the various simple soaps to observe whether they possessed the power of forming these characteristic doubly refractive globules.

That certain soaps under certain conditions produce myelin bodies has been known for long[2] and has been the subject of study, more especially by Quincke. One has but to take a drop of oleic acid on a slide and surround it with strong ammonia[3] to obtain immediately a brilliant development of myelin figures, and, what is more, these figures examined between crossed Nicol's prisms are doubly refractive (Fig. 3). We can produce "myelin forms" from an ammonia soap. This, however, is not quite the same thing as reproducing the characteristic doubly refractive spherules such as we have seen in the tissues of the organism. Briefly, I may state here that with certain simple soaps it is possible to gain these spherules, and that by very simple means, namely, by taking the pure soap with a small quantity of water on a slide, warming it until it dissolves, and then as it cools it may be that under the polarizing microscope a perfect rain of spherules shows itself. In some cases these persist for hours and, indeed, for days; in others, depending on the nature of the soap, they are transient appearing for a moment and immediately giving place to a brilliant white layer of formed crystalline plates.

By this means we determined that simple soaps of oleic acid give these figures—oleate of ammonia, of sodium and potassium, so also those of calcium—but here appeared to be a difference: the calcium globules would seem to be relatively solid, the others relatively liquid. But by no means was I able to gain the phenomenon with simple soaps of palmitic and stearic acids: on cooling concentrated solutions they passed immediately into the true crystalline form, and as these palmitic and stearic soaps are solid and definitely crystalline at the room temperature it seemed evident that the spherules seen in the organism at room temperature could not be of palmitin or stearin compounds, or at least could not be simple uncomplicated compounds of the same. It is possible, I would suggest, that compounds containing palmitic or stearic, along with oleic, acid may be fluid at room temperature.

Here I trust that you will not misunderstand me. I do not in the least wish to suggest that the doubly refractive bodies seen in, or gained from, the tissues are simple soaps of oleic acid. The very instability of the oleates of ammonia, sodium and potassium renders this most unlikely. All I wish to show at this stage is that we have a group of relatively simple bodies of known composition, of bodies having the curious physical properties that are likewise possessed by the myelin of the organism, and to suggest that a study of these simple cases is calculated to throw light on the more complicated. This certainly it has accomplished, and here, before referring to our studies on more elaborate compounds, it is fitting and timely that I should indicate how the study of the simple soaps afforded us what I believe to be a most important clue to the nature and properties of the myelin in general.

I have already mentioned that studying strong solutions of the simpler soaps these remarkable doubly refractive globules make their appearance as the solution undergoes cooling. Time and again the appearance is transient. At one moment the whole field of the microscope may flash out into a rich clustered constellation

2. Neubauer in the '60's seems to have been the first to make the observation.

3. The experiment is more striking as noted by Lehmann if the ammonia and oil be colored by contrasting dyes.

of bright crosses to be followed almost immediately by complete crystallization of the whole area. This fact alone, not to mention the doubly refractive nature of the globules, indicates that they are akin to crystals. Obviously they are not crystals proper; the form is not that which we associate with crystals; they are globular, not angular; they have all the appearances of being fluid bodies and not solid; in water they do not dissolve as do ordinary crystals, but swell up and gradually lose their doubly refractive qualities. This, notwithstanding they may appear as an intermediate stage in the process of crystallization of the pure oleates out of pure watery solutions.

WHAT IS THE MEANING OF THIS PHENOMENON?

Not one of those who had worked on the myelins had even incidentally touched on this question. Nevertheless the solution had already been given by the physicists. To one of these, Professor Schenck, working in the very next institute at Marburg, we went with our inquiries and found that he had been busied over this very problem for the past few years. Schenck himself, it is true, had not discovered the solution, that was due to Professor O. Lehmann,[4] of the Technical High School in Carlsruhe, who two years ago had entombed his findings in a huge quarto monograph of 250 pages, a superb example of everything that a monograph ought not to be—verbose, diffuse, wandering, abundantly polemic, wanting in anything of the nature of a table of contents, let alone an index; in short, wholly medieval save for its profuse and admirable illustrations (which nevertheless are devoid of legend or key), and for the valuable facts that can be dug out of its pages. Schenck, who had been working independently along the same lines, has given to the world a luminous description of the whole matter, giving clearly in a few pages all the important data and conclusions gained from the researches of Lehmann and himself[5] and his pupils.

The popular impression is that a crystal is essentially a solid unyielding body. It has indeed been known for long that metals like lead and gold, can, under pressure, be forced through apertures; the same is true of solid (or crystalline) sodium, of wax, paraffin, etc. But the general impression has been that change of shape in these cases is essentially brought about by translation, by the minute solid crystals of these substances gliding one on the other, or even—as shown by my colleague, Prof. F. D. Adams, in his remarkable observations on the alteration in shape of marble cubes submitted to great pressure—by actual rupture of the crystals, the separate parts gliding the one on the other.

Undoubtedly, this does happen with certain crystalline substances, but Lehmann, in 1889, first called attention to another order of phenomena. If solid cholesteryl benzoate, which is in the form of colorless crystalline plates, be heated to the temperature of 145.5 C., it melts into a turbid fluid having the consistence of olive oil. Heated still further, as Reinitzer first showed, at 178.5 C., it suddenly becomes a perfectly transparent fluid. Studying the intermediate stage, Lehmann found that under the polarisation microscope the turbid fluid, despite its fluidity, exhibited double refraction with the crossed Nicol's prisms—a property hitherto regarded as associated with the solid crystalline state; heated to 178.5 C., the field became dark and isotropous, like ordinary fluids. If the opposite process were now undertaken and the heated fluid subjected to cooling, the whole field became converted into a mass of doubly refractive spherocrystals, showing here and there little dark crosses; cooled further, these gave place to plates of the solid modification, which plates grew in size until they occupied the whole field.

In fairly rapid succession other substances were determined having the same peculiarities. Other compounds of cholesterin with the fatty acid series, such as cholesteryl acetate, cholesteryl propionate and cholesteryl oleate, compounds of oleic acid: sodium, potassium and ammonium oleate, as also methyl-, dimethyl- and trimethylamin oleates—various paraderivatives of anisol and phenetol. In Table B I have transscribed the list given by Schenck last year, adding thereto certain compounds found by us to possess the same properties, acknowledging that it is not complete, and that already numerous additions have been made during the last few months.

TABLE B.—POTENTIAL FLUID CRYSTALLINE SUBSTANCES.
(Modified from Schenck, with additions.)

Name.	Melting Point in degr. Centig.	Clearing Point in degr. Centig.	Observer.
Silver Iodid	145	450	Lehmann.
p-Azoxyanisol	116	134	Gattermann.
p-Azoxyphenetol	137.5	168	Gattermann.
p-Azoxyanisolphenetol	93.5	149.6	Gattermann.
Azin of *p*-Oxethylbenzaldehyd	172	199	Gattermann.
Anisaldazin	160	180	Franzen.
p-Methoxycinnamic acid	170	185.7	van Romburgh.
Condensation product from benzaldehyd and benzidin	234	260	Gattermann.
Condensation product from *p*-Toluylaldehyd and benzidin	231	300	Gattermann.
p-Azoxybenzoic acid ethylester	113.5	120.5	Vorlaender, Meyer and Dahlem.
p-Diacetoxyltolluylene chloride	124	138	Muench.
Hydrocarotinbenzoate	..	..	Reinitzer and Lehmann.
Cholesterylacetate	90-100	114-114.4	Reinitzer & Schonbeck.
Cholesterylpropionate	98	114	Obermueller.
Cholesterylbenzoate	145.5	178.5	Reinitzer.
Cholesterylbutyrate	..	..	Adami and Aschoff.
Cholesterylstearate	..	..	Adami and Aschoff.
Cholesterylpalmitate	..	..	Adami and Aschoff.
Cholesteryloleate	..	..	Reinitzer.
Potassium oleate	..	..	Quincke and Lehmann.
Sodium oleate	..	..	Quincke and Lehmann.
Ammonium oleate	..	..	Quincke and Lehmann.
Dimethylammonium oleate	..	..	Quincke and Lehmann.
Trimethylammonium oleate	..	..	Quincke and Lehmann.
Cholin oleate	..	..	Adami and Aschoff.
Neurin oleate	..	..	Adami and Aschoff.

All these bodies become fluid on being heated, but the fluid examined between crossed Nicol's prisms has still the main optical features of crystalline substances; it is anisotropous. Some of these crystalline liquids are thick like olive oil, some (like *p*-azoxyphenetol) are more fluid than water. Poured into a vessel the surface becomes level; in tubes it assumes the characteristic concave meniscus of fluid bodies, and this although the constitution is crystalline. Heat to a further degree and the fluid becomes wholly isotropous; it gains all the physical properties of what we regard as a true fluid.

In this intermediate stage, then, we deal with crystalline fluids and the individual crystals are "fluid crystals." Though here a distinction is drawn by Lehmann and Schenck between "flowing" or ductile crystals (fliessende Kristalle) and "fluid" (flüssige) crystals proper. The former we encounter in crystalline fluids of the

4. Lehmann (O.): Flussige Kristalle sowie Plastizitat von Kristallen, etc., Leipzig, etc., Leipzig, Engelmann, 1904.
5. Schenck (R.): Kristallinische Flüssigkeiten und Flüssige Kristalle, Leipzig, Engelmann, 1905.

thicker, less fluid type, the latter in the more watery fluids. The former, under the microscope, are of definitely crystalline structure, needle-shaped or prismatic, but tending to have rounded edges and angles. If the cover-glass be pressed (as I have repeatedly confirmed), they become distorted, returning to their original shape when the pressure is removed (Fig. 5). The latter under the ordinary microscope show no signs of crystalline structure, they appear as masses of spherical bodies, capable of distortion, lying in a singly refracting, isotropous, matrix. But one and the same substance may exhibit both forms; there is no absolute division into substances exhibiting purely the one or purely the other, while if any of these bodies be distributed in an inert fluid matrix the individual aggregations are peculiarly apt to take on the sphero-crystalline form, appearing as doubly refracting globules—identical with those that I have described to you as encountered in the tissues.

It need scarcely be said that these observations, completely overturning the older ideas of the properties of crystals, have from many quarters been regarded as heretical and have encountered violent opposition. I am, as I have said, no physicist, and should therefore not presume to weigh the evidence that has been tendered against these conclusions. I can only say that I have seen with mine own eyes that these sphero-crystals and ductile crystals are capable of distortion (vide Fig. 5)—that they are not solid. A very natural suggestion has been made that we have here to deal with substances of two orders, that, on heating, a purer more crystalline matter separates out from a more inert fluid menstruum of different constitution. G. Quincke, for example, has urged that the conditions correspond with those found in emulsions, a fluid "skin" surrounding and leading to the persistence of the separate globules. Tammann has compared this stage to what is seen in an emulsion of carbolic acid in water, which from being cloudy becomes transparent on heating, and holds that here is not a true crystallization but a depolarization phenomenon. Lehmann has brought forward proof that we have to deal with true double refraction and not a depolarization phenomenon, and he and Schenck have shown that the phenomena present themselves equally well with chemically pure substances of this order.[6]

Here, then, for the first time, we gain a satisfactory physical explanation for the doubly refractive globules seen in, or obtained from, the organism; they are fluid sphero-crystals.

CAN WE PROCEED ANY FURTHER?

As I have already stated, the investigation of compounds presenting this intermediate stage is a recent study, the number found is increasing with relative rapidity, and it is well within the bounds of the possible that yet other substances, constituents of the normal organism, will be found to possess it. But what is not a little suggestive is that the physicists, without any thought of physiologic problems, have already noted its existence in two groups of bodies which are normally represented in the organism, namely, the cholesterin compounds and the oleates. And studying the list of crystalline fluids and the temperatures at which the intermediate stage manifests itself, with the exception of one group these bodies pass into what, for convenience, I term the intermediate stage, at temperatures far above that of the room or body, thus save for that one group they can not be responsible; the only group containing members which afford doubly refractive globules at room temperature is that of the compounds of oleic acid. These compounds are so unstable—the oleic acid so readily undergoes dissociation—that it is hopeless or almost hopeless to gain them in a pure state, and as a consequence it is not possible to state with precision what are the points of melting and clearing. But certainly cholesteryl oleate is viscid and buttery at the room temperature, and at this can be demonstrated to afford the globules, and the simple oleates of ammonium, potassium and sodium may likewise continue to manifest them at the room temperature,[7] although in general the fields show definite crystals. Here it may be noted that the medium in which the soaps are present is capable of modifying the melting point. To this fact I shall have to return later. Cholesteryl palmitate and stearate I have found both afford these globules and so exhibit the intermediate stage, but their melting point is very definitely higher. I am led thus to exclude the simpler palmitates and stearates from the causes of the phenomenon in the organism, although the possibility must not be forgotten that bodies like certain of the lecithins which contain body oleic and palmitic or stearic acid radicals, may eventually be found to afford the reaction.

These considerations, therefore, so far as it is legitimate to carry them, distinctly favor the view that the myelin globules of the organism are probably of the nature of oleic acid compounds—are soaps of oleic acid of greater or less complicity.

It deserves pointing out that from wholly different considerations, namely, from the point of view of chemical analyses of myelin containing substances, the earlier workers have arrived at conclusions which are approximately in harmony with those of ours. Lieberich, for example, analyzing nerve matter, determined that the constituent which was the essential cause of the myelin figure formation—or otherwise the myelin proper—was the protagon which he was the first to isolate. With Apathy I may add, I have found the myelin figures from nerve matter under certain conditions doubly refractive. Now protagon dissociates into lecithin, fatty acids and neurin or cholin, and while crystalline protagon treated with water merely swells, affording no myelin figures, if a drop of oleic acid under the microscope be acted on by a solution of cholin or neurin, I gained an immediate development of exquisite doubly refractive myelin figures—as exquisite as when strong ammonia acts on oleic acid. It is not therefore the protagon as such, but dissociated cholin oleate or neurin oleate[8] that would seem to be the base of the myelin formation in nerve matter.

There is another body which separates out abundantly in the alcoholic extraction of nerve matter, namely, cholesterin. This in itself does not afford the intermediate state, but its compounds with the fatty acids manifest it, and it is quite possible that such compounds play a part in the myelin formation seen in fresh nerve tissues. We owe to the elder Beneke in 1862 the first recognition of the significance of cholesterin in myelin production. He showed that while olive oil treated with

6. Had we to deal with emulsions, centrifugating should separate the two constituents, or, passing an electric current through the medium the suspended particles, if of different constitution, should gather at one or other pole. Schenck has shown that with pure substances neither of these events occurs.

7. Evidently these myelin globules of the organism are not doubly refractive at blood heat. I could not demonstrate those of the adrenal in a warm room at the Rockefeller Institute (about 75° F.) until the window had been opened and the room cooled down.

8. There is still some doubt regarding the identity of cholin and neurin. I have, however, gained a compound of oleic acid with both substances.

caustic potash afforded myelin bodies, the more cholesterin he added to the oil the better was the result; that alcoholic extract of egg yolk freed from cholesterin gave no myelin figures; that ordinary soaps on the addition of cholesterin gave them. In other words, he produced experimentally impure cholesteryl oleate, palmitate and stearate. He called attention to the existence of cholesterin in tissues affording myelin and concluded that in animal and vegetable tissues "Ohne Cholesterin keine Myelinformen." Liebreich retorted with his observations on protagon, and Beneke's work became discredited. Nevertheless, Aschoff and I believe that Beneke, if too extreme in his dictum, was largely right, and that in many situations in the body the myelin globules are of the nature of cholesteryl oleate. This, it may be noted, as shown by Hürthle, is a constant constituent of the blood. In the atheromatous patches in the aorta, in old cataracts of the eye, and in other necrotic areas, it is a matter of familiar experience that we encounter fatty globules along with plates of cholesterin, and here, too, we meet with the myelin globules. An incidental observation on an aorta showing early atheroma impressed me greatly. The smear from a small area of slight softening presented numerous fatty globules and cholesterin crystals, but no doubly refractive bodies. I heated it gently over the flame, and on cooling there appeared abundant myelin globules, more particularly in the neighborhood of the cholesterin platelets, which now exhibited a somewhat corroded appearance. Nay more, we would suggest that cholesteryl oleate is the source of cholesterin calculi in the gall bladder.

Cholesteryl oleate excreted from the blood into the bile (and as Virchow showed, myelin is present in the normal bile), may in the alkaline fluid easily undergo dissociation, the oleic acid combining to form simple diffusible soaps, the cholesterin being set free. At the last meeting of the German Pathological Association at Stuttgart, Aschoff demonstrated the presence of the doubly refractive myelin globules in the cells of the mucous membrane of the gall bladder.

We thus have what I regard as strong presumptive evidence that at least two groups of oleic acid compounds give rise to the myelin globules of the organism—the cholin or neurin, and the cholesterin. There is a third group deserving consideration, namely, the lecithins. Regarding these I would speak with considerable caution, while at the same time stating my conviction that some of them give origin to myelin globules. These lecithins, I may remind you, dissociate into fatty acid, glycerophosphoric acid and cholin. According to Carbone, in dissociation they may give rise to fatty acids, neutral fats and cholesterin. Here once more we have this suggestive appearance of the two substances of widely different chemical nature, cholin and cholesterin, each of which we have found associated with the development of myelin globules.

From the tissues there have been gained a di-oleo-lecithin, a di-stearo-lecithin and a palmito-stearo-lecithin.[9] They also, it will be seen, are fatty acid compounds. They afford "myelin figures" of a simple type and doubly contoured myelin droplets, but thus far with the pure substances free from cholesterin I have been unable to gain doubly refractive globules. It is deserving of note that the two issues affording myelin in greatest amounts contain normally the most abundant lecithin, namely, the brain and the adrenals, and that, as Albrecht has pointed out, the abundant "myelin" obtained from the red corpuscles is composed in the main of lecithin. More particularly is it in connection with autolysis, and the self-digestion of tissues that the association of lecithin and the appearance of "myelin bodies" has of late been commented on from various quarters. Time forbids that I should enter at length into this most interesting field. I can only very rapidly point out that if a sterile organ be kept with all aseptic precautions at the body temperature, its cells in the course of a few hours exhibit abundant small rounded irregular bodies in their cytoplasm, possessing double contour. Coincidently, the nuclei become pale and it can be made out (Albrecht, Dietrich and Hegel) that the chromatin becomes discharged into the cytoplasm, the appearance of the myelin bodies bearing a definite relationship to the discharge of the chromatin.

Some but not all of these afford obscure double refraction. As indicated by the accompanying table from Waldvogel and Mette, while in autolysis of the liver the ethereal extract (of total fatty substances) is not greatly increased, the fatty acids and neutral fats in the cell undergo great increase at the expense of the lecithin, as does also the cholesterin.

No. of Days.	Lecithin.	Fatty. acid.	Neutral fat.	Cholesterin.	Ethereal extract.
0	11.8	0.52	0.06	0.07	13.4
13	6.82	1.80	0.96	1.80	13.0
44	1.06	3.74	3.61	5.41	15.9

With Dietrich and Hegel, it is difficult not to be forced to the conclusion that the lecithins with their glycerophosphoric acid are intimately associated with and derived from nuclear material with its glycerophosphoric acid; and that the myelin-like bodies in the cytoplasm are of the nature of lecithins, which lecithins undergo subsequent dissociation. My present view—which I admit is subject to revision—is that it is not the lecithins proper that afford the doubly refractive globules, but the products of their dissociation and more particularly those of the di-oleo-lecithins—the interaction between the cholin and the cholesterin and the oleic acid. For it must be kept in mind that oleic is a singularly weak acid, that its compounds are singularly liable to hydrolysis with liberation of free oleic acid. As a matter of fact, lecithin warmed with cholesterin, affords with water or dilute glycerin exquisite doubly refractive myelin figures, as again by acting on pure lecithin (Riedel's lecithol) with alkalies, the doubly refractive globules can be gained. Schenck, indeed, lays down that the salts (soaps) of oleic acid never exist in a chemically pure state; there is always some water and alcohol mixed, free oleic acid and free alkali. This natural impurity is very possibly a feature of importance in the myelin formation by members of this group.

Let me, in conclusion, state that I have not brought up this matter of the doubly refractive myelin globules as a method by which the existence of myelin in the tissues of the body can surely be recognized. That is by no means the case. The formation of these globules is no constant reaction. What I would emphasize is that under certain conditions, not always easily obtainable, Virchow's myelin can be shown to possess this very characteristic reaction, and that so, the myelin figures and myelin globules in the organism must be regarded as of fatty nature, and more, that these belong to that remarkable class of substances possessing an intermediate state in which they are present in the form of fluid or of ductile crystals.

9. According to the recent very full studies of Thudichum every true lecithin contains at least one oleic acid radical.

This in itself, while a matter of interest, would not perhaps be of great importance were it not that associated with this property, as pointed out by Schenck, is a further one which we are led to regard as of great significance. Schenck has called attention to the fact that whereas ordinary crystalline substances permit of mixture with other substances to a very limited degree, all the members of this class, even when of widely different chemical composition, unite in all proportions, the melting point of the mixture being then determined by the relative amounts of the two substances present. If, then, we admit that more than one substance present in the organism belongs to this class, it is by no means assured that a given doubly refractive sphero-crystal (in the adrenal, for example) is composed of a single substance. It may be an admixture of two or more. Nor is this everything. Their power of mixing with and absorbing other substances is very great, not to say extraordinary. With water, for example, the oleates, the lecithins, protagon and allied bodies, do not in the first place dissolve. They absorb it and swell up. Only after they have swollen up greatly does solution, or what appears to correspond to solution, show itself, for there is still debate among the physicists regarding the solubility of these bodies. What is true of water is true of a large number of other substances; oleic acid, for example, and neutral fats are absorbed, and within certain limits, despite the presence of these foreign substances, the globules continue to exhibit double refraction. Such admixture, for example, occurs in the adrenal. Studying the adrenal juice under the polarizing microscope, one of the earliest facts that strikes the observer is that the globules are of varying luster, some bright and clear, others pale, others faint, just discernible shadows. And in addition one finds aberrant globules. Figure 6 shows some of the forms I have seen.

Remembering that these lipoid myelins are widely distributed through the organism, this power of admixture and absorption appears to be most significant. To this Albrecht has already called attention in connection with the abundant myelin of the red corpuscles. It is these properties which favor the action of the erythrocytes as common carriers of the organism. It is not necessary that diffusible bodies become chemically combined with the substance of the red corpuscles; they may be merely absorbed and easily yielded up when the surroundings become altered.

Most suggestive of all seems to me the observations of Albrecht and Dietrich and Hegel on the one hand, that the myelin of the cells in autolysis makes its appearance in the cytoplasm coincidently with the loss of the nuclear chromatin—and our own observation, that outside the body it is possible to gain union between oleic acid and nitrogenous bases, such as cholin and neurin. It is true that so far no one has been able to demonstrate the existence of protein-fatty-acid compounds. Brücke, Quincke and Klotz have all concluded that they must exist. This demonstration of ours of the existence of cholin and neurin oleate is, I would suggest, a step in this direction.

If fats can be taken into the protein molecule—if the lecithin-like bodies of the nucleus and the cytoplasm exist there normally in intimate association with the protein constituents—then we gain a valuable insight into the most perplexing matter of fatty degeneration. Fats, that is, appearing in fatty degeneration and necrobiosis, are not necessarily or entirely due to absorption from the blood and lymph, as Rosenfeld would hold, but some at least are products of the disintegration of the complex molecules of living matter. With many workers on autolysis we have to recognize a succession of steps from the most highly organized nuclear materials through the myelins to neutral fats, fatty acids and cholesterin. There is a myelinic preceding the fatty degeneration; or, more accurately, in true cell degeneration, as distinct from infiltrative processes, the disintegration of the cell substance may well be in two stages, bodies of the myelin type being formed first, and these being followed with further dissociation by the appearance of fatty bodies of simpler type.

Original Articles

RELATION OF ALCOHOLISM TO EPILEPSY.*

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The relation of alcoholism to epilepsy is a subject of such magnitude, so comprehensive and varied, that I shall confine myself briefly to but one part of one aspect of it, namely, the relation it bears in the moderate drinking parent to epilepsy in the child, leaving as the subject for a future paper the grosser and more palpable development of epilepsy in the drunkard himself, as a result of his excesses.

There are illustrations, as you know; everybody knows of the extreme cases, where the victim of drink is not an epileptic and not commonly understood to be a drunkard, and yet as a result of his occasional convivial habit, or of his becoming slightly intoxicated almost every night, epilepsy or other neuroses manifest themselves in one or more of his children, just as fortunately there are cases where epilepsy in the parent as the result of drink, is not transmitted to the child, at least in the first generation.

These anomalies of apparently spontaneous development and atavism constitute some of the many etiologic perplexities of this multiplex condition, that already have had their Columbus, and only hope for the advent of some therapeutic or histologic Newton, to explain their mysterious pathology and suggest a cure, or in other words, they have already been discovered, and but await the Puritans, like our great ancestors, to perceive possibilities of prevention and elimination, and when this is not possible, to do the best with existing conditions.

The grosser specimens of this dissimilar transmission from parent to child—intoxication in the parent, epilepsy in the offspring—are so frequent that they may be read about at large in any of the standard books on the subject; and the various insane asylums and epileptic colonies of the world afford numerous examples of the old, old phylactery that 'the sins of the father are visited on the children unto the third and fourth generation."

If I may be permitted an aside, perhaps relevant, I would say that I have often wondered if this familiar quotation from the Decalogue did not imply on the part of the Mosaic writer a recognition of the law of atavism —reverting to the original type—so emphasized by modern scientific authors, as if it was a new physiologic discovery, or does it mean that in case of great transgression, for example, habitual drunkenness, the fourth generation would be the last; that outraged Nature resented the offense on the part of an unfit ancestor by obliterating the progeny after the fourth inheritance?

* Read in the Section on Hygiene and Sanitary Science at the Fifty-seventh Annual Session of the American Medical Association, Boston, 1906.

We know that in certain forms of degeneracy such is the case sometimes still—physical deterioration ending in extinction—and we also know, too, as in Brown-Séquard's neuropathic guinea-pigs, that when undisturbed and properly cared for they dropped the inherited convulsions artificially induced, and returned to the normal guinea-pig state. Why can not we do this? Why can not an attempt at the production of this natural process become a recognized therapeutic agency? We get rid of other things inherited from ancestors, why may we not, like guinea-pigs, get rid of inherited epilepsy also? I think the time has come when we can.

No matter how little your faith then in heredity, no matter how much you resent the frequently extravagant claims of those who believe in the transmission of everything, not only of diseases and tastes, but even accomplishments and acquired traits, yet when it comes to the matter of the relationship of drunkenness in the parent to epilepsy and other neuroses in the child, there can be but one opinion. Here is a form of heredity that can not be denied. The testimony of experts in the matter is so overwhelming that you must be convinced, and the acceptance of this well-attested fact is of the utmost importance to every one interested personally or professionally in preventive medicine.

As far as alcoholism is concerned, my own personal experience would seem to imply that the danger to the prospective child depends not exclusively as to whether the parents, one or both, were habitual drunkards, as to whether they were intoxicated or under the influence of alcohol during the time of conception, and that a drunken parent, other things being equal, if perfectly sober and free from the irritability, remorse and exhaustion consequent on a debauch, is no more likely to produce epileptic offspring than an abstainer would, who might chance to be intoxicated for the first time.

Two epileptics now under my care, the only cases occurring in their respective families, were traced by the parents themselves to single transgressions in the use of intoxicants, and another, that of a young imbecile girl, was conceived, her father confessed, at a time when, because of business perplexity and failure, he had abandoned himself to drink, "being," he said, "in a state of continuous intoxication ending in delirium tremens, for nearly three months. Four children born before this crisis in his affairs, and two born since, are perfectly well.

Children whose geneses result from such unions, must, almost necessarily, you might think, be born with that excessive reflex susceptibility that makes them prone to epilepsy and other mental or motor disturbances, or in other words it would seem that offspring born of such abnormal consorting inherit a psychical vulnerability, not like Achilles, of the heel only, but of the whole nervous system, which but waits for the touch of the invisible hand, the special exciting cause, to develop into epilepsy or some other disorder of voluntary motion, such as chorea, vasomotor spasm and allied distempers of the nerve centers.

Dr. Spratling, of the Craig Colony for Epileptics, in his admirable book, "Epilepsy and Its Treatment," quotes Maudsley approvingly where he says that epileptics because of drink, etc., on the part of the parents, "are as much manufactured articles as are steam engines and calico printing machines," and Dr. Spratling himself, as the result of extensive observation, having a thousand epileptics under his care, firmly believes that drunkenness in the parent is frequently transformed into epilepsy in the child.

Echeverria, who analyzed no less than 572 cases, says, "Parental intemperance solely originates the predisposition to epilepsy in 17.30 per cent. of them, and parental insanity, associated with epilepsy, 15.96 per cent., nearly 16 per cent." This is a very remarkable statement, as it shows that a greater percentage of epilepsy is produced by intemperance on the part of parents than by insanity and epilepsy combined. It is truly a most startling observation. According, also, to this writer, alcoholic epilepsy was more common among the working classes. Molli[1] asserts that from 30 to 40 per cent. of all persons with drunken fathers were epileptics.

The same writer quotes from M. Hippolyte Martin, who collected a number of interesting facts in regard to the influence of parental intemperance in the production of epilepsy in children. In 150 cases of insane epileptics at the Salpetrière he found that 83 had intemperate parents, nearly 60 per cent. He divides them, according to Dr. Hare, from whose comprehensive prize essay I quote, into two classes, the first comprising 60 cases, or over two-thirds, in which alcoholism in the parent was a certainty, and second, those in whom such a history was not found. Martin also found that in 83 intemperate families with 410 children, 108, or more than one-fourth, were epileptics.

He also gives the cause of the deaths of the parents in a number of cases, to show that no hereditary tendency other than alcoholism produced epilepsy, and this, too, in that France, where we are sometimes led to believe that the favorite beverage is light wine, and that there is no intemperance.

In estimating the number of epileptics in different parts of Russia, Kovalovosky writes as follows (quoted by Dr. Spratling):

> Caucasus is a country of grapes and wine. The natives quench their thirst not with water, but with wine that contains from 5 to 15 per cent. of alcohol. Wine drinking is so common in Caucasus that no one considers it inebriety. Everybody knows what a high percentage of epilepsy is caused by the abuse of alcoholic beverages. I have spent the summer during the past 15 years in Caucasus, where I have a medical practice, and in no place have I had so large a proportion of epileptics among my patients.

Bourneville, who studied 2,554 children admitted to the Bicêtre and Fontain Vallee, 2,072 boys and 482 girls, all of them suffering from idiocy, imbecility, epilepsy and hysteria, found that 1,053 of them were the offspring of drunken parents, 983 having drunken fathers and 80 drunken mothers.

Demaux asserts that among 36 epileptics whom he examined during 12 years, whose histories were well known to him, 5 were conceived when their fathers were intoxicated.

In conclusion allow me to cite two more examples from my own case book:

> I. C., a lawyer, who hardly knew the taste of liquor until he was a prosperous man, with no hereditary taint, in the beginning of his career became the father of four healthy children. Afterward, when he had attained comparative fame and a wine cellar, and had become a good deal of a *bon vivant*, two other children were born, one of which developed uncomplicated epilepsy in his sixth year. The other had paralytic dementia, with epilepsy.
>
> Another patient, a traveling salesman, with a good family record, who "even when on the road never drank during business hours." With the beginning of prosperity this man

1. Neurolog. Centralblatt, 1885.

began the habit of imbibing at dinner, and finally continued his potations into the night, his wife and friends frequently joining him. Three of his eight children are epileptics, and yet no one but his intimates are supposed to know of his conviviality, as he only drank in the night. Once he said to me: "Formerly I drank for pleasure; now I drink because of remorse."

Such illustrations might be repeated indefinitely, but I think I have said sufficient to convince you that there is a definite relationship between alcoholism and epilepsy.

THE VALUE OF TEMPERANCE INSTRUCTION.*

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The Woman's Christian Temperance Union, which I have the honor to represent here to-day, has within its ranks a large number of women who are, or have been, engaged in the profession of teaching. The combination of temperance worker and teacher naturally led to great interest in the effort to safeguard the young against alcoholism by incorporating in the school curriculum, in connection with the study of physiology and hygiene, the results of laboratory investigations of the effects of alcohol on the human body. This instruction has been greatly hampered in its influence for good by the hostility of some educators; yet its value has been recognized in many homes and certified to by many who have enjoyed its benefits.

In New York State several years ago an attempt was made by friends of moderate drinking to weaken the temperance instruction law. The State W. C. T. U. sent a circular letter to hundreds of mothers asking an opinion of the value of this instruction as seen in its effects on their own children. A large number of replies was received, all testifying that wherever the law had been faithfully observed and the instruction given without adverse comment the effect on the children was to cause them to resolve in favor of total abstinence.

Very interesting instances might be given of children from drinking families, some of them foreigners by birth, who have become total abstainers through the influence of faithful teachers of physiology and hygiene.

The value of temperance instruction has been recognized by employers of labor, also, such as railroads, street car companies, steel corporations, bonding companies and many other companies dealing with large numbers of men. They have learned through it that there is no good reason why men should drink liquors containing a dulling stupefying poison like alcohol and as clear brains are necessary in these days of rush and competition the large business corporation which does not now put restrictions on the drinking habit of its employés is an exception.

The commercial value of the temperance instruction of American schools has attracted attention in European countries; consequently men conducting large manufacturing enterprises in England, Belgium, France and Germany have been asking for like education in their public schools.

The possibilities wrapped up in this instruction for improvement in health and morals appeals to the medical profession, and some thousands of England's physicians have united in memorializing the British Parliament for a temperance instruction law. The Emperor of Germany, after personal study of the American system, has introduced alcohol physiology into the elementary schools of his empire.

These are noteworthy indications of the estimate that men of keen business perception set on temperance education. They realize that drunken employés are a great loss to the industries of a nation.

Valuable as have been the results of the endeavor to forewarn the children of the nation against the formation of alcoholic habits, much more might have been accomplished had all educators and medical men been in active sympathy with these teachings. The errors and weaknesses complained of might have been eliminated sooner if aided by friendly criticism. The adoption of Mrs. Hunt's reply to the Committee of Fifty as a United States Government reply has done much to discourage opposition to this movement, hence greater results may be expected in the next decade than in all the troubled years of its past history.

There is pressing need, however, of an extension of temperance instruction so that the adult population may be touched more closely. We have university extension lectures on many subjects; why can not we have some systematic course of extension lectures on alcohol physiology? If a series of public lectures, covering the main points of alcohol physiology on which leading investigators agree, were arranged for in school houses through the co-operation of physicians, educators and school mothers' clubs, vast good would certainly be accomplished. In a few cities boards of health and the Woman's Christian Temperance Union have co-operated in holding meetings devoted to health topics and to discussions of the evils of "patent medicines." But if county medical societies were to arrange with school authorities for a series of lectures on alcoholic drinks it would attract widespread attention; the press, ever ready to report the new and striking, would give such matter all the necessary head lines and good audiences would be assured.

The need of some such movement is manifest everywhere. The ravages of alcoholic drink are to be seen in the remotest villages of our country, and native races on other shores coming into contact with our traders are perishing by thousands from the white man's rum. Jails, asylums for the insane and the feeble minded, hospitals, poor houses are all crowded with the victims, direct or indirect of alcoholism. A physician connected with an asylum containing over four hundred feeble-minded girls told me that she had studied the history of each inmate, and could say truthfully that about 90 per cent. were in that institution as the result of the drunkenness of one or both parents. The brothels and dives of our great cities are kept supplied with girls largely through the agency of alcoholic drinks. Girls do not seem to know that wine and beer inflame the passions, and at the same time lessen self-control and impair the judgment, and for lack of this knowledge thousands of girls are destroyed, body and soul, every year. Evil men know the effects likely to be produced by these drinks, so lure thoughtless girls to partake of the wine or the beer under pretense of friendship and having a "lark," but the end thereof is shame, disgrace and destruction. Rudyard Kipling, with the true poet's heart to feel for humanity, saw this frightful evil in Buffalo some years ago and declared that it made him a prohibitionist. Would it not make every manly man with the instincts of a savior of

* Read in the Section on Hygiene and Sanitary Science at the Fifty-seventh Annual Session of the American Medical Association, Boston, 1906.

the weaker sex feel the same way if it were brought directly before his eyes as it was with Kipling? Physicians connected with hospitals have found sad cases of young women from good homes who have been led from virtue through indulgence in wine. Only a few days ago in Chicago four girls from respectable homes were found dead drunk, or worse, in a carriage at the back door of a dive where they had been left by order of the men who a few hours before professed to be their friends and took them out for a "good time." Knowledge of the danger lurking in the ruby wine or the foamy beer might save many a thoughtless girl. Too often the instruction given in the schools had no deterrent effect because the teacher lacked sympathy with the subject and taught it with a sneer. Too often the sneer was the result of the way the subject was treated in institutes which such teachers attended. For this and other cogent reasons supplementary education on alcohol coming with strong medical authority is a necessity.

It is sorely needed by young men as well as young women. Thousands of young men, many even from christian homes, drink during the college years, thus losing much of intellectual uplift, and thereby handicapping themselves for the race of life. They seem to think it smart or daring to get drunk. If the universities provided lectures on the injurious effects of alcohol on the brain and nerves, with explanations of its seductive nature in enchaining its victims, might there not be a mitigation of the drunkenness among students which so vexes the presidents of some colleges? It would not seem so glorious an adventure to get drunk if young men were told that the eminent student of alcohol, Sir Benjamin Ward Richardson, M.D., had said that he believed a brain once stupefied by alcohol could never again be quite equal to what it was before.

In Europe the temperance movement which is now gaining such hopeful headway began with members of the medical profession. Several years ago in Paris a physician holding an important municipal office became alarmed by the prevailing misconceptions of the Atwater experiments and conceived a unique way of instituting a total abstinence propaganda. He prepared large placards setting forth the salient evils of alcoholic drinks and posted them in many public places throughout the city. This example has been copied by some of the boroughs of London and by other English and Scotch cities. A more striking way of conveying temperance instruction could scarcely be devised.

Why do people need to be told the nature and effects of alcoholic liquors in school, by lecture or by placard? Because the great majority of those who drink intoxicants believe they are useful if taken in moderation. The laboring man hears beer called liquid bread, and spends his money freely for it, not only because he likes it, but because he thinks it strengthens him and helps him to do his work. He knows that physicians have given beer and wine and whiskey to the sick "to strengthen and sustain them," and he reasons that what is food for the sick must also be beneficial to those in health. He has never heard of the large class of physicians who make little or no use of alcohol in their practice.

So, also, with mothers in the home. They know that some physicians give alcoholic liquors in consumption, in fevers, in pneumonia and other ills, and because of this these mothers keep the whiskey, or brandy, or "patent medicine" bottle on hand, and resort to it in every little weakness which may afflict the family. Glibly will women talk of how good a whiskey sling is for a cold, and rock-and-rye and peruna are familiar "dopes" in many a household where the beverage use of the lightest liquor would not be tolerated. If a temperance worker suggests to such a woman the danger of setting up an alcoholic craving in her child the usual reward is a look of great superiority, and an assurance that she is not afraid. The superstitious belief in the medicinal and food qualities of alcoholic liquors, so commonly held, must be removed from the public mind before there can be much hope for the cessation of intemperance with all its attendant evils. This can be done only as physicians of distinguished position speak out fearlessly what the people need to know. Who can measure the good which has resulted from the clear, strong, scientific teachings against alcohol of the late Nathan S. Davis, of Chicago, and Sir Benjamin Ward Richardson, of London? May it not be that the influence of Dr. Davis has had much to do with the fact that many Chicago physicians have very little use for alcohol in their practice? For thirty years Dr. Davis had charge of the medical wards of Mercy Hospital, Chicago, and during all that time not a drop of alcoholic liquor was administered to a patient in those wards. While other hospitals were publishing death rates in typhoid fever of 16 to 25 per cent., Mercy Hospital had only a 5 per cent. death rate. In pneumonia, while other large hospitals had death rates varying from 24 to 38 per cent., Mercy Hospital had only a 12 per cent. death rate. Dr. Davis was justified by his hospital experiences in abjuring alcoholics.

The teachings of Nathan S. Davis, Richardson, Kassowitz, Woodhead, Treves, Hall, Crothers, Kellogg, Hewes, Madden and other physicians of like views have been put into leaflet and pamphlet and book form by the department of medical temperance of the National Woman's Christian Temperance Union, and are being read and studied in thousands of homes. This kind of temperance instruction is most hopeful, for when people learn that some of the most successful physicians of the world do not believe in the necessity or usefulness of alcoholic liquors in the treatment of disease they are much less likely to begin the use of these seductive drinks.

The department of medical temperance began the public agitation against "patent medicines" which the magazines have recently carried on so forcefully. The evils of "patent-medicine" using, however, will never cease while such multitudes of people believe that alcohol is a useful medicine. When told that peruna was found by analysts of the U. S. Government to be a cheap "cocktail" masquerading as a medicine, peruna lovers exclaimed, "Well, isn't alcohol a good medicine? Don't the doctors use it?"

It is evident to all close students of the drinking habits of the people that the tap-root of the nation's intemperance is the belief in the nourishing and strengthening properties of alcoholic liquors. Destroy this, and how long would an intelligent people spend $1,000,000,000 a year on alcoholic drinks? But it never can be destroyed without large help from the medical profession. There should be published from time to time strong articles against alcohol by prominent physicians, and by many of them. The people have a right to expect that their medical advisers will warn them against whatever is injurious to physical health and strength.

A large section of the medical profession is in deep sympathy with every wise effort against intemperance; why can not something be done to focus this sentiment so that it shall bring light to the American people on a subject vital to their best interests? As superintendent

of the department of medical temperance of the National W. C. T. U., I have seen the great need, even in temperance homes, of instruction in the teachings of non-alcoholic physicians; and I wish to thank many of you present for help and encouragement in the work assigned to me of being a medium between good physicians and the people.

THE VALUE OF INSTRUCTION REGARDING ALCOHOL.*

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There is not to-day a more important question for educators to consider than the one here presented for discussion. I feel certain that we shall all enter on it with minds open to conviction on all points. We are all in search of that happy and safe middle ground of truth and justice which history has shown invariably lies between the positions occupied by the partisans in a controversy.

I wish first to formulate a few general principles or theses which may be discussed individually. The acceptation or rejection of each thesis in its order will bring us progressively nearer and nearer to a definitely formulated policy, acceptable to members of the teaching profession as well as to the medical profession.

I. Natural Objects and Natural Phenomena Should be Studied in all Public Schools.

All leading educators accord to the study of nature a prominent place in their systems of education. These systems may differ from each other widely in detail, but they possess one feature in common; and that is a provision for the study of nature.

Whether the pupil is a kindergarten child or a high school youth he is invariably interested in the study of natural objects. The discipline afforded the pupil is most natural and profitable. In the study of the object the senses are exercised and the attention cultivated; the formation of percepts and concepts involves the activity of memory and of reason. The description of objects gives opportunity to cultivate language, both oral and written. Incident to this expression of ideas the pupils get their drill in orthography, etymology, syntax, punctuation, writing, reading, perhaps, also more or less collateral work in arithmetic, geography, history and literature. The expression of ideas through diagrams and drawings should also be emphasized.

Thus a trip to the field, the lake shore, the swamp, the pasture, the woods, or to a flowing stream may provide material for a fortnight of most profitable and inspiring work. It is understood, of course, that all the nature work done in the grades should seem to be more or less spontaneous on the part of the pupils. The season, the weather, some astronomical phenomenon of unusual interest may furnish material for a week's work. The teacher takes the material at hand and makes the most of it.

This method of presenting the natural objects which form the material of the natural sciences precludes the possibility of a systematic presentation of the facts and principles of biology, physics, chemistry, geology, or astronomy. In the grades there should be no attempt to separate out and systematize the facts and principles. Up to the age of 14 the whole field of Nature should be carefully and minutely observed, simple experiments performed, and the results of all observations carefully noted and used as subject-matter for a large part of the school work.

In the high school the study of nature is no less important than it is in the grammar schools. A smaller proportion of time should be devoted to it, and here for the first time the facts and laws of natural phenomena should be systematically presented in the form of sciences. The high school curriculum should provide science courses in biology, physics, chemistry, geology, astronomy, and perhaps other sciences, all carefully limited in breadth and depth to the mental attainments and capacity of the average pupil of high school age.

II. The Study of Living Forms and of Life Phenomena Make an Important and Essential Part of Nature Study.

Having set forth some of the pedagogic possibilities of nature study in the grammar schools and the relation of this work to the natural sciences as presented in the well-equipped high school of to-day, it now becomes necessary for me to show the relation of biology to natural science in this general system of education.

Any teacher in the grades will bear testimony to the abiding interest which pupils uniformly take in living forms and life phenomena. From the day when the pupil is allowed to bring his pet cat or dog to the kindergarten to serve for the subject of a lesson to the time when he is allowed to make a careful study of one plant from the seed which he plants in the ground, to the gathering of the next generation of seed, the teacher finds living forms and life phenomena an open sesame to the pupils' attention and interest.

In the presentation of these objects of study to children and youths, it is my observation that the interest is far more keenly awakened by the study of what an animal does than by the study of its structure. We all know how interesting to a boy or girl is a mill in operation; they like "to see the wheels go round."

So in the study of living nature the questions which the pupils ask make it evident that they are far more interested in the functions of the various parts of an animal than in the construction of the animal, i. e., they are more interested in physiology than in morphology.

III. The Physiology of Living Forms is the Most Interesting and Profitable Field of Biologic Study.

The facts and principles which make up the sum of our knowledge of living forms—our science of biology—may be classified under two general heads, comprising what we know of form and structure (morphology) and what we know of function (physiology). As already set forth above, the interest of the pupil is far more easily aroused in a queston of action (physiology) than in a question of structure.

The instinctive interest of the pupil should be the teacher's guide.

In the other fields of nature study the pupil's interest in the action, rather than in the structural or physical qualities of the natural objects involved, has led teachers to dwell with special emphasis on the action rather than on the structure. In the light of this experience teachers may proceed with full confidence that in emphasizing the functions (physiology) of living objects they are in

* Read in the Section on Hygiene and Sanitary Science at the Fifty-seventh Annual Session of the American Medical Association, Boston, 1906.

harmony with the highest authorities in methods of presenting natural science.

But physiology so far discussed up to the present time belongs to what is known to physiologists as general physiology. The field of general physiology—i. e., the activities, habits, etc., of plants and animals—should always be presented to pupils before they take up the consideration of any of the more specialized fields of physiology.

Incident to the study of living forms and their actions, the pupil will discover some day that his body possesses many structures similar to those possessed by the animals which he is studying. His pet dog has body, legs, head, eyes, ears, nose, mouth, tongue, teeth. The dog runs, walks, lies down; he sees, hears, smells and feels; he gets hungry and thirsty; he eats and drinks. These points of likeness appeal to very young children. They begin to ask questions. Their questions must be answered, and their interest satisfied. When this subject is launched by the question of some bright and observing pupil, then is the teacher's golden opportunity. Then she can afford to drop all other study for a week or a month and study man.

This opportunity may present itself in the third, fourth or fifth grades for the first time. In either case the teacher must be cognizant of the limitations of her pupils and not lead them beyond their depth. Legitimate subjects of study would be: What does man eat? Where and how is it produced? How is it prepared? Why does man eat? How does the body use the food? What happens to food in the mouth, the stomach, the intestines? How is the food (digested food) distributed to the parts of the body where it is needed? Why does man need to breathe? What kind of air should one breathe?

These and many other questions of this scope can be taken up with pupils of the fourth to the sixth grade, spending much or little time each year or season, according to the pedagogic indications at the time. The trained teacher will appreciate what I mean by pedagogic indications. A cramming or forcing process is never indicated pedagogically. If the pupils are not interested in a subject, no matter whether the subject is plant life, water action, wind action, digestion, sentence construction, cotton growing, word structure, cattle raising, or punctuation, when the interest flags change the subject.

We are led here to formulate a fourth proposition:

IV. The Physiology of Man Is the Most Interesting and Important Field of Physiology.

V. Rules of Hygiene Form Legitimate Corollaries to Principles of Physiology and Should Be Presented in Their Logical Relations.

When one is discussing mastication and the use of the teeth, the necessity for thorough mastication and insalivation can hardly be omitted from the discussion. The care of the teeth seems to be a most natural topic to discuss incident to the study of their use. There seems to be no tenable argument against allowing the discussion of rules of hygiene in connection with each function studied. On the other hand, a failure to discuss these rules and to emphasize their importance would be an omission of a duty. The pupil's mind is prepared for it. To formulate a rule for hygienic living based on the solid foundations of demonstrated science is to follow the instinctive inclination of both pupil and teacher. Then let hygiene be taught in the common schools.

How much hygiene should be taught? So much and only so much as is logically correlated to the physiology given. These rules of hygiene should be the formulated conclusions, based on physiologic facts and principles.

VI. The Physiologic Action of Things in Such Common Use as Chewing Gum, Tea, Coffee, Tobacco and Alcohol Should Be Discussed as Freely and as Fully as the Action of Rice, Eggs, Butter and Water.

If I were asked whether I should give more time to the consideration of these deleterious substances than to the consideration of wholesome foods and beverages, I should unhesitatingly say, No! I should emphasize particularly the value of wholesome foods and beverages, and I should lead pupils to discover the folly of the use of the unwholesome ones.

Having thus demonstrated that it is pedagogically proper to instruct pupils regarding the action of alcohol and other narcotics on the body; that it is pedagogically proper to teach pupils the elementary facts of hygiene, including the dangers of indulgence in stimulants and narcotics, we come to the question at issue: "What is the value of instruction regarding alcohol?

In the first place it is universally admitted that the use of alcohol is dangerous; further, that a knowledge regarding danger is valuable. Education is the great reforming influence. Knowledge is the safeguard of society. The present generation is protected against the ravages of cholera, of smallpox, and of yellow fever through a widely disseminated knowledge on the part of the people regarding the general causes of these diseases and the rational method of checking their spread. If the future generations are to be protected against the appalling ravages of "the white plague" and against the degenerating influences of that curse of man, alcohol, it must be similarly through a wide dissemination of knowledge regarding them. Therefore, I say educate, educate, educate. Let the children, the youths, the young men and women know the whole truth, and the value of that knowledge will make itself manifest through a rapid decrease in the ravages of tuberculosis and alcoholism.

If boys and girls are taught the dangers of the moderate use of alcohol, few of them will later suffer from the effects of its excessive use.

[THIS SYMPOSIUM ON ALCOHOL, BEGUN LAST WEEK, WILL BE CONTINUED NEXT WEEK.]

Dark Living Rooms and Tuberculosis.—Juillerat states that during the ten years 1894-1904 about 38 per cent. of all the cases of tuberculosis in Paris occurred in 5,000 houses. In 259 of these buildings, sheltering a population of 25,938 persons with a mortality of 7.98 per thousand, inspection disclosed 2,627 rooms with no light and no ventilation. Neighboring buildings with identical conditions in every respect except that the rooms were better lighted, had none of this excessive mortality. He urges physicians to impress on their clients the supreme importance of sunlight to health, and to persuade them to insist on having sunlight and air in their living rooms. If tenants shun dark, ill-ventilated apartments landlords will in time find it to their advantage to provide apartments with the necessary requirements. The pioneer work in the line of educating the people to the absolute necessity for sunlight and air in living rooms must be done by physicians; the enlightened demand will in time regulate the supply. Juillerat is the originator and is in charge of the "sanitary house book" system in Paris, described in these columns recently, on page 2169 of the last volume. His article is published in the *Gazette Méd. de Paris* for January 5, with the unusual notice: "Reproduction of this article is authorized."

INFANTILE HEAD NODDING AND ROTARY SPASM.

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This condition was described by Henoch many years ago and since his time cases have been reported by Hadden, Peterson and others. In the *Lancet*, June 14, 1890, Hadden takes up the phenomenon at some length, citing five cases, typifying variations with sufficient constancy to warrant sub-classes. His general title is: "Head Nodding and Head Jerking in Children, Commonly Associated with Nystagmus."

The condition is characterized by nodding or lateral movements of the head, singly or associated with one another or with movements of rotation. The rotary spasm is the most frequent. The oscillations may be slow or rapid, and at times almost continuous. An interesting feature is the fact that these movements all cease during sleep and when the child is lying down. There may or may not be an associated nystagmus; it may affect one or both eyes; it may accompany, precede, or follow the head movements, is more rapid than the oscillations of the head, and has its own independent rhythm. Convergent strabismus may characterize a few cases.

The etiology is extremely obscure. As its occurrence is usually between the ages of 3 and 18 months, it has been ascribed to dentition. It has been confused with a form of epilepsy—eclampsia nutans or salaam convulsion—but in these cases there is disordered or transitory loss of consciousness and such cases usually develop into the ordinary form of epilepsy. Osler speaks of the nodding spasm under conditions involving the spinal accessory, as it is the muscles innervated by this nerve which are chiefly affected. It is thought by some authors to be a habit spasm. In three of Hadden's cases the condition followed head injuries, and some of the obscure cases of nystagmus, he believes, come under this category of nodding spasm. The condition lasts several months, and while recovery is the rule, it is apparently uninfluenced by drugs, except that some cases seem to improve under the bromids.

History.—Female, aged 6 months, breast fed, and giving no history of head injury or of sickness. There were no heredity taints of significance. The mother was much alarmed over the sudden development of the head spasms which occurred at intervals from three to five minutes, the excursions being widely to the left and in an upward direction. The spasm consisted of a combined nodding and rotary movement. An upward rolling of the eye balls with vertical nystagmus, together with muscular twitching of the lids, ushered in and accompanied each spasm. The spasm lasted about a minute. These manifestations ceased during sleep and when the child was lying down. Aside from somewhat exaggerated restlessness, the infant presented nothing unusual; she was well nourished and in every way presented a healthy appearance.

Treatment.—The condition remained unchanged for two weeks under small doses of Fowler's solution. No choreic movements were noticeable. Potassium bromid was then added to the treatment and the spasms became less frequent and pronounced after the third week, and now, after two months, the mother states that they are no longer noticeable.

The Telephone in Medicine.—The danger of prescribing by telephone should be borne in mind by every physician. It would be better if no prescription were ever given by telephone, and advice thus given should be of a harmless character and incapable of being misunderstood.—*Central States Medical Monitor.*

A CASE OF SECONDARY HYPERNEPHROMA OF THE IRIS AND CILIARY BODY.*

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The man whose history is here detailed came under my observation first in the wards of the Germantown Hospital on Oct. 11, 1905. He had had hemorrhoids, and Dr. C. A. Whiting had operated recently for the removal of them. The house surgeon, Dr. Markle, called my attention to the man because of there being, as he supposed, a growth in the left eye.

At the time I made my examination the patient was in what he deemed his usual good health and suffered only from his rectal disease. In the month past he had been annoyed by obscuration of his sight, especially of the left eye, though that eye was neither painful nor tender. I discovered on his body, beneath the skin, over the region of the costo-cartilaginous junctions on the thorax, several nodular enlargements. These masses were movable and reminded me of the enlargements of the cervical glands common in constitutional syphilis. In the left groin there was a large bubo.

Arising from the middle pillar of the iris of the left eye, and on the horizontal meridian, was a spherical tumor, mottled gray in color and approximately 4 mm. in diameter. No signs of inflammation were present. On the nasal side of the globe were several leashes of dilated blood vessels which were arranged triangularly with the base at the limbus. The tumor was flattened against the posterior membrane of the clear cornea.

The iris presented no other abnormality. The pupil was round, about 4 mm. in diameter and changed freely to various stimuli. By oblique illumination no defects in the lens were noticed. The anterior chamber was of the depth of that of the fellow eye; the tension being only slightly raised above that of the right. No tenderness was elicited. The right eye presented no anomaly. Vision of the right equaled 6/6, of the left 6/30, Snellen. The iris contracted when a solution of atropin was instilled, and the pupil was broken by the projection of the mass into the pupillary space.

The tumor appeared to rise from the radiating muscular fibers. There was but slight protrusion backward, the base therefore was buried in the pigment layers of the iris; the anterior surface was flattened against the endothelial membrane of the cornea. It was globular in outline though somewhat nodular in conformation and was attached to the iris by a short broad pedicle. It resembled the small granulomata frequently seen in the conjunctiva at the apex of the socket remaining after an enucleation. The tumor was highly vascular, the fine loops giving a pink stippling to the grayish-yellow color of the denser portions. The lens was clear; the vitreous had begun to disorganize, for there were large floating masses in it, while more deeply situated was the semblance of "brick dust" deposit. The optic disk was round; its upper border whole, while about the lower was a wide, sharply-cut conus.

This conus I conceived to have been formed by an axial distension rather than to have been a part of a general inflammation of the choroid that was present in other parts of the fundus, and because the refraction of the eye was measured by a minus 4 D lens. The choroiditis was of comparatively recent origin. The macular region was not affected. The retinal epithelium was markedly absorbed; the outlines of the tortuous vessels were blurred, but no hemorrhages were noted.

The patient, aged 40, stated that shortly before admission to the hospital his attention had been called to the presence of a small lump in his eye. This lump, he was cer-

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* Read before the American Ophthalmological Society, session at New York City, June 28 and 29, 1906.

tain, had increased in size rapidly though it never had been painful, neither had the eye been inflamed. In the spring of 1903, this eye had been struck with a small stone. The man said that he applied for treatment at the Wills Hospital. The injury must have been slight and the symptoms transitory, because only a simple lotion was prescribed and he was advised to report again to be fitted for glasses. His recollection of the examinations made of his eye at that time, were not strong, yet he remembered that his condition was such as to occasion comments from the surgeon in charge and his staff to several visitors present in the clinic. It may be presumed, however, that no unusual growth was perceptible then, for the man would have had the recollection of an allusion having been made to it had such a thing been noticed. I have not been able to find any record of such a case as this at the Wills Hospital; therefore the antecedent history is uncertain.

The man was a carpenter; married and had three children. His childhood had been healthy; in adolescence he had a simple attack of typhoid fever. In 1902 he became infected with syphilis. He was not treated for this disease, for, shortly after noticing the initial lesion of it, he was arrested for drunkenness and loafing and was committed to one of the penitentiaries. He declared to me that he was refused treatment by the resident medical officer of that institution. After serving his term he returned to his work, but even then he had had only the most irregular kind of treatment. No member of his rather large family had a history of consumption or of tumors.

I suspected this to be a case of sarcoma of the iris, yet in view of the general history, I did not forget to consider the probability of there being a specific element in the genesis of the tumor. Accordingly, for 5 days, the ointment of mercury was vigorously applied thrice daily. At the end of this course there was a perceptible softening of the subcutaneous tumors, but that of the iris remained unaffected.

A few days later, when the eyes were examined again, there were evidences of cyclitis in the left. The sclera was faintly injected and numerous precipitates were lodged on Descemet's membrane. In the right eye were signs of active chorioretinitis, though the blue iris was healthy. By October 20, the ciliary injection had increased considerably, while the tumor appeared to have spread out slightly, and to be less closely applied to the cornea. Also, it had become distinctly lobulated and irregular in outline. I believed that I had to deal with a very active and malignant process. The patient refused to have the eyeball removed, but on October 23, after inventing many pleas by which to escape from the hospital, he at last consented to an operation for the removal of the tumor. I removed the tumor by a wide iridectomy. The incision was made with a broad keratome in the nasal limbus. As the space between the limbus and the tumor was small, and as I feared to lacerate the tumor, I withdrew this knife and lengthened the incision by lateral strokes with a narrow angular blade. This part of the operation was prolonged by a very annoying hemorrhage. With a many-toothed capsule forceps, I caught up as much of the surrounding iris as could be grasped, and withdrew the entire mass with the tumor and excised it with spring scissors. Great and prolonged hemorrhage followed. Much of the effused blood escaped from the anterior chamber after the wound was flushed with boracic acid solution. The toilet of the wound, however, was performed satisfactorily, after which I applied a light compress over each eye and then bandaged both.

Seven hours later the patient was resting comfortably, and when the dressings were removed early the next morning only slight operative reaction was present. The wound had closed and the chamber had reformed. Atropin was instilled and the bandages were reapplied. The eye soon healed. The edges of the coloboma were adherent to the lens capsule. This synechial attachment in all probability had existed prior to the operation, for it was with difficulty that the iris could be caught into the jaws of the forceps, and doubtless this lack of resiliency occasioned the profuse hemorrhage that followed the excision of the iris. The lens was clear, though there were several clumps of pigment on the capsule. In about two weeks the patient was discharged from the hospital.

In order to study the histology of the tumor the specimen was intrusted to Dr. C. M. Hosmer, of the Medical Laboratories of the University of Pennsylvania, who prepared for me many beautiful sections from almost the entire tumor, which he has stained by a variety of methods.

The tumor springs from the anterior surface of the iris, and the site of it occupies the middle portion of the section which was excised. The normal tissues about the base of the tumor are destroyed by the infiltration of the tumor cells. The outer portion of the iris is apparently uninvolved and the sphincter remains intact.

The tumor is without a capsule or other limiting membrane. The substance of it is composed of numerous thin-walled blood vessels and spaces which branch in many directions in the midst of cellular elements. In the iris stroma are a few vessels having normal coats, yet elsewhere, the vessels or spaces are formed by channels, with thin coats of fibrous connective tissue, lined with endothelial cells which are in the process of proliferation. (Fig. 1).

The cells are arranged in layers. They are large and present a variety of shapes, passing from the columnar, when next the blood vessels, to the polyhedral, oval or round, according to the pressure made on them as the periphery of the tumor is approached. In the iris stroma the cells are not clustered about the vessels but are more generally distributed. (Fig. 2).

The individual cell is composed of fine granular protoplasm and a large nucleus with a distinct nucleolus. The cells are evidently multiplying rapidly, for, in many of those lying nearest to the vessels there is more than one nucleus, each with its own nucleolus, though no karyokinetic figures are discerned. At a distance away from the vessels, too, the nucleolation is seen, yet here the protoplasm has become vacuolated as though degenerative processes had set in. At that time, judging from the character of the cells and of their arrangement about the vessels, the growth was regarded as a perithelial sarcoma by Prof. Allen J. Smith, of the University of Pennsylvania, to whom I showed the slides.

I saw the patient at various times subsequent to his leaving the hospital. Within the week of his discharge he was committed to the House of Correction on the charge of vagrancy. This was early in November. He was released on December 22. I visited him there. During his confinement specific remedies were administered to him and he soon gained in weight. In the week following his release from the hospital, my records show that the cornea continued clear; the sclera was without injection; the cicatrix was absorbing; the anterior chamber deep and the aqueous free from precipitates. The iris coloboma had become quadrate rather than triangular because of the adhesion of the pillars to the lens capsule. The remaining portion of the iris was healthy and responded to the action of atropin. The lens was unclouded and the state of the vitreous unaltered. The nerve head had become swollen and it was impossible to study its features in detail. The choroidal inflammation was extending in all directions. The condition of the right eye remained unchanged.

Early in January, 1906, the man's testicles had become somewhat enlarged and he complained of pain and heaviness. I referred him to Dr. Hilary M. Christian. Later, he turned up in Dr. Christian's ward at the Philadelphia General Hospital, where he was treated with anti-syphilitic remedies. While there, a number of small nodes were noticed lying beneath the skin on his thorax, like those I had discovered while he was under my care. These softened and became smaller when mercury was pushed, in the same manner as those which I have already described. Several of them were excised, and pronounced sarcomata by Dr. Rosenberger, pathologist of the hospital.

On January 26, the man was anxious for me to see his eyes, and he asked to be allowed to come to me. To all appearances the ocular conditions had not changed; but on February 1, he came again, complaining of intense pain in the left eye. There was a small foreign body on the cornea, but, in addition, the cornea was steamy and surrounded by a ring of ciliary injection, while the iris was obscured by the turbid aqueous. The tension was not elevated. I removed the foreign

body and bandaged the eye after instilling solutions of cocain, dionin and atropin. Four hours later the symptoms had not abated.

A day or two later, I was informed that he had returned to Blockley, but this time he entered the Eye Wards. On February 7, I was invited to visit the patient through the courtesy of Dr. John Welsh Croskey, the alternate of Dr. Charles A. Oliver who was unable to serve at the hospital because of an illness.

The patient's ocular symptoms had become more profound. There was greater injection, greater cyclitis, haziness of the lens, a more clouded vitreous and an indistinct fundus. The intraocular tension was elevated, and yet the tension of the right eyeball was equal to that of the left. The man lay curled up in his bed; he had lost weight, and presented signs of cachexia. In the days following, the pain increased so greatly that he begged for the removal of the eye, fearing the right eye might become similarly diseased.

On Saturday, February 17, Dr. John Welsh Croskey removed the eye, and the large inguinal gland also; he most kindly gave the specimens to me. The globe measured 25 mm. in the anteroposterior diameter, 23.5 mm. in the vertical, and 23 mm. in the transverse. It had been most cleanly dissected from the socket; the sclera being smooth, and the attached nerve, which measured 6 mm. in length, appeared healthy. No tumor was detected in the globe by transillumination, and on section of the globe no evidences of a neoplasm were apparent. The vitreous chamber contained a shrunken mass of vitreous, the retina had been detached pathologically, and the nerve was swollen. The cornea had become clouded; the anterior layers of the iris were covered with a grayish exudate and the lens had become cataractous and was dislocated toward the nasal side. Dr. Harold Goldberg, pathologist of the Wills Hospital, prepared the globe and stained several sections in the usual double stains. The globe had been divided horizontally, in order that the region of the coloboma might be included in each of the sections which were taken from the upper half of the globe. Study of these sections elicited the following details: Except at the sclerocorneal junction, where there is a moderate leucocytic infiltration, the cornea is not affected; and polymorphonuclear leucocytes occupy the angles of the anterior chamber and extend over the surface of the iris. Newly proliferated connective tissue cells have invaded the stroma of the iris. The lens is dislocated, its capsule is separated, its fibers shrunken and opaque. The ciliary body is atrophic; the inner surface is covered by a leucocytic exudation; the pigmentation is excessive and the endothelial cells have proliferated greatly.

In addition to the changes described, the processes have been destroyed by a papillary new growth, composed of small round cells with deeply stained nuclei. The growth extends into the vitreous chamber; some of the cells have escaped and have been caught in the shrunken and degenerated vitreous. There are no signs of the new cells having invaded the choroid which has become atrophic while the pigmentary elements are prolific. The fiber layer of the retina is thick. The retinal vessels are greatly enlarged and engorged with blood and leucocytes. The nerve head is swollen; the fibers atrophying from the leucocytic infiltration, and the endothelial cells are increasing. In Dr. Goldberg's opinion this ciliary neoplasm is a small round celled sarcoma in which there are signs of melanotic changes. (Fig. 3).

In the latter part of March the patient returned to the Germantown Hospital. He was emaciated and weak. The orbital socket had remained healthy. The right eye showed evidences of advancing choroiditis. On April 17, he showed violent symptoms of acute intestinal obstruction. Dr. Francis Stewart opened the abdomen and discovered a long intussusception in the ileum, which he reduced. The abdominal viscera were studded with neoplastic formations. The position of one of these tumors was such as to effect an invagination of the intestinal tube. The patient rallied from this shock. About May 10, the abdominal wound burst; a day or two after, the intestinal wall ruptured and a fecal fistula became established.

In the second week in May I took all of my preparations to Professor Smith; he had not seen the sections of the subcutaneous nodules. These nodules have a distinct and fatty capsule. The growth is made up of large flat cells in which are large nuclei, though many contain nucleoli and some are multinucleated. The cells are divided into masses by dilated alveolar walls. These walls are almost completely made up of capillary blood vessels. Dr. Smith thought this tumor resembled the tumor found in the iris and he believed it to be an endothelioma. A day or two later, however, while studying the three different specimens, and comparing them in detail, a diagnosis of hypernephroma was made, and Dr. Smith urged that in the event of an autopsy, special care should be given to the examination of the kidneys and neighboring structures, with the expectation of finding such a primary growth. On Monday, May 21, the patient died.

Thus ends the clinical history. I believed that I had been dealing with a case of primary tumor of the eye. The diagnosis has been reversed completely by the findings just indicated, and in the examination of the tissues after death.

Death was caused by an intussusception of the ileum. This intussusceptum is a couble one, one portion being directed upward and the other downward. The apices of the two intussuscepta meet in the lower part of the mass. Each apex is formed by a tumor, the larger being 3.5 cm. by 3 cm. in size, sufficient to have caused a partial obstruction in the intestine, and thus to have facilitated the invagination of the gut. On the inner surface of the intestine are many tumors, in size varying from 1 mm. to 2 cm. In the mesentery are a number of enlarged glands and tumor nodules, ranging up to within 1 cm. in diameter. None of the abdominal organs contained these nodules except the left kidney. In the envelop of this kidney are 8 or 10 small tumors, the largest about 1 cm. in diameter. Most of these masses are nodular, reddish-gray in color, and very much resemble the appearance of the tumor found in the iris.

At the lower pole of the kidney, and protruding from it, is a rounded tumor, from 3 to 4 cm. in diameter. This tumor involves the kidney though it is surrounded by a distinct capsule; the gross appearance is like that of the other tumors already noted. At the upper end of the pelvis, in the substance of the kidney, is a smaller mass resembling the larger one, though it has not so definite a capsule. The right kidney is not involved, except in the perirenal fatty envelop where are a few small secondary nodules. The suprarenal bodies are not affected. The portions of the lungs removed from the thorax do not contain any neoplastic formations; neither were any found in the heart.

The sections from the kidney show that organ to have been changed but little. The tumor is divided into long narrow alveoli by delicate fibers and branching blood vessels. In some fields the blood vessels or spaces seem to be the only marks of division. This alveolar arrangement strongly suggests the fascicular zone of the suprarenal gland. The cells, which are epithelioid in type, vary much in size and shape; being polyhedral, oval or rounded according to the pressure made on them, and they seem to spring from the septa, forming distinct mantles about the blood vessels. The cells have much homogeneous protoplasm and a large nucleolated nucleus. Neither here, nor in any of the sections examined subsequently, were any of the coarse granules commonly met with in functionating adrenal tissues seen. The size of the nuclei is irregular; in several instances the nuclei occupy nearly the entire cell, and in others, the cells are polynucleated. In Professor Smith's opinion, the general appearance of the specimen corresponds with that of a hypernephroma. (Fig. 4.).

The intestinal growth involves the submucosa. Its histologic appearance is exactly like that of the renal tumor. The basal cells are more densely packed than those at the periphery, where also the mantles about the vessels are pr nounced. A section from the mesentery displays features common to the other nodules.

The sections of the subcutaneous nodules and of the inguinal gland have been prepared with less care than the others, and they present artefacts, yet, except for minor distinctions, their characteristics correspond to those of the structures already described.

The tumor of the ciliary body is regarded by Professor Smith as identical with the others. The cells spring directly from the surface of the processes. They are not supported by an intercellular stroma, but in several places are seen delicate outgrowths of fibrous tissue in which are blood vessels about whose thin walls are grouped the tumor cells. The retina is involved near the equator, the cells being confined to the inner layers. They are closely packed about the narrow blood spaces and they are smaller and apparently younger than the cells found in the iris and the ciliary processes. In this specimen the polynucleation is marked. The iris tumor bears a strong likeness to the gross structures of the other tumors. The central, basal part is dense, while the peripheral portions are loosely arranged in indefinite and coarse branches. Under higher powers the central portion is alveolated, while the peripheral is composed of thin-walled vessels surrounded by the layers of cells.

Having these sections before us one after another, we may safely declare that we are dealing with a case of hypernephroma. The primary tumor developed from an adrenal rest in the left kidney. The secondary metastasis has been conveyed by the blood, although the deposits in the mesentery might have been carried there by the lymph stream as well as by the blood.

The term hypernephroma is applied to tumors arising from suprarenal glandular tissue. It is of recent origin and was used for the first time in 1896 by Birch-Hirschfeld.[1] The genesis of these tumors was not understood before 1883, and they were called by many different names, as lipoma, sarcoma, adenoma, angioma, endothelioma, etc. In that year Grawitz,[2] in his paper, "The So-called Lipoma of the Kidney," described their real character as arising from the suprarenal tissue, whether in the normal position in the gland or from aberrant fragments found in other organs and known as "adrenal rests." The term is not applied to growths in the suprarenal itself, but to those arising from the "rests" located elsewhere.

Notwithstanding the statement to the contrary, these tumors can not be rare; general surgeons are reporting hypernephromata with increasing frequency; indeed, since the death of my patient, I have learned of several recent cases, and in the literature of malignant tumors of the kidney they have been found to be very common. The embryologic development of the suprarenals is in close relation to that of the primitive kidney and of the sexual organs; it is not to be wondered at, therefore, that particles of this glandular tissue should be found misplaced in the kidney, or elsewhere, having been located as "rests" in new situations.

The degree of their malignancy, from the onset of the symptoms to a fatal termination, is very great and varies from 6 weeks to 3 years, although in some instances there has been no malignancy at all, and the tumors have been found only by accident in postmortem examination. The malignancy is shown by an invasion of the kidney and contiguous organs, or by more distant metastasis. The mode of metastasis is conceded to be by the venous circulation through the medium of the renal vein and the vena cava. Although the period between the death of the man and the presentation of this communication has been very brief, I have done all that I could to search through the literature on this subject. I have not been rewarded by finding the report of an instance in which the metastasis has extended to the eye. It is doubtful whether an accurate diagnosis of hypernephroma can be made before an exploratory operation. The most important symptoms are hematuria, renal colic and the detection of a tumor. All these may occur together, any one may occur alone, or, as in the case we are studying, they all may be absent. The general symptoms, consisting of asthenia, depression and emaciation, were distinctly marked, however, in this case. I could not describe the rapid change in this man's health in other terms than by the comprehensive one of "cachectic."

It is quite impossible to guess how long the process had existed in this man. It is not unlikely that it was a hyphema that the surgeons noticed when he went to the Wills Hospital in 1903, and it is conceivable that such an effusion might have been caused by the lodgment of an embolus in an iridic vessel. Hypernephromata, in the sense of their being adrenal rests, may arise in early life, then lie dormant for years and develop rapidly with fatal effects after 40 years of age.

The microscopic characters of the tumor and of the metastatic deposits described in this paper are fairly representative of the histology of hypernephromata, and I may not here enter into any discussion of the histogenesis of this class of tumors. For those who wish to investigate the subject I will refer them to the singularly comprehensive studies of Aloysius Kelly[3] and to the more recent contributions of Hoche,[4] Albarran and Imbert.[5] In a report of two cases by Keen, Pfahler and Ellis,[6] a summary of the present status of the subject is given and a complete bibliography is appended to their paper.

It must be admitted that the opportunity to study this case is an unusual bit of good fortune. To all who have been associated with me in it I can only express my most sincere thanks for their courtesy to me and for the pains they have taken in the preparation of the data. I must express my indebtedness to Professor Smith for his kindly interest and helpfulness, without which it would have been impossible to have completed this paper.

There has now been presented a complete history of a case which at the beginning appeared to be one of a primary tumor of the eye, with a probable convection to the internal organs. Examination after the death of the subject shows that the process was the reverse, and the further study showed that it was of unusual pathogeny, with manifestations in an organ not hitherto mentioned as having been the seat of a secondary invasion by such a tumor.[7]

The result of this study leads me to wonder what a thorough examination of the internal organs in cases of ocular tumors with fatal metastasis might lead to if it were possible to follow the cases to necropsy. In analyzing the histories of primary tumors of the eye, the records show that it has not always been possible to do this. The relations, therefore, as to cause and effect, between the ocular tumors and the internal growths have not in all cases been defined. May it not be true, then, that many instances of so-called primary tumors of the eye which come under the observation of the ophthalmic surgeon, and in which the opportunity for a confirmation by autopsy has been lost, are, in reality, secondary to some concealed primary growth?

235 S. 13th St.

1. Lehr. d. Path. Anat., V. Aufl. I. p. 262, 1896.
2. Virchow's Archiv. f. Path. Anat., 1883, xciii, p. 39.
3. Phila. Med. Jour., 1898, July 30.
4. "Les Lesions Du Rein." Paris, 1904.
5. "Les Tumeurs Du Rein," Paris, 1903.
6. Trans. Coll. of Phys., Phila., 1904, p. 251.
7. Dr. Verhoeff has called my attention to the report of a case of epithelial tumor of ciliary body published by R. Schlipp of Wiesbaden, in v. Graefe's Archives, 1899, xlviii, p. 353. Schlipp presumed that he was dealing with an unusual form of endothelioma; but, studying his paper in the light of my own case, I am convinced that the tumor he described was an hypernephroma. The patient was a young girl.

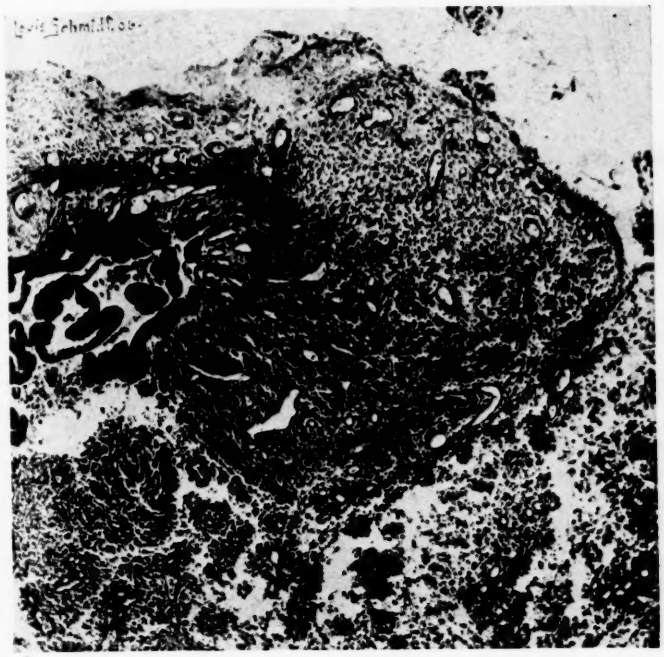

Fig. 1.—Section of iris tumor. Secondary hypernephroma.

Fig. 2.—Section of iris tumor.

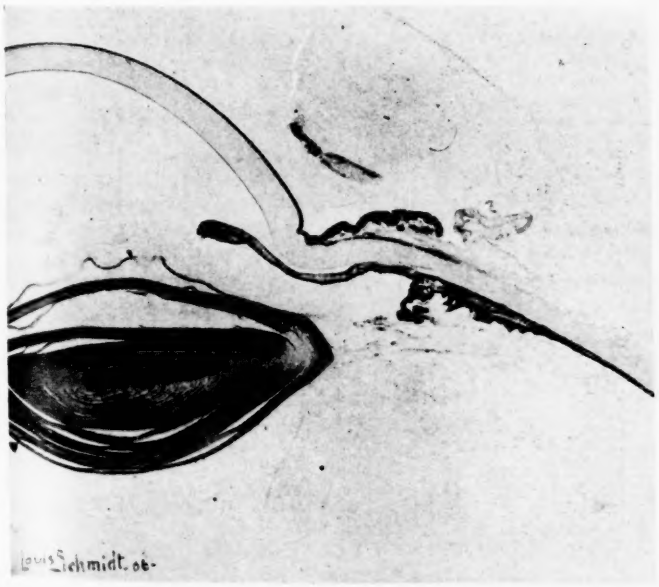

Fig. 3.—Involvement of ciliary processes.

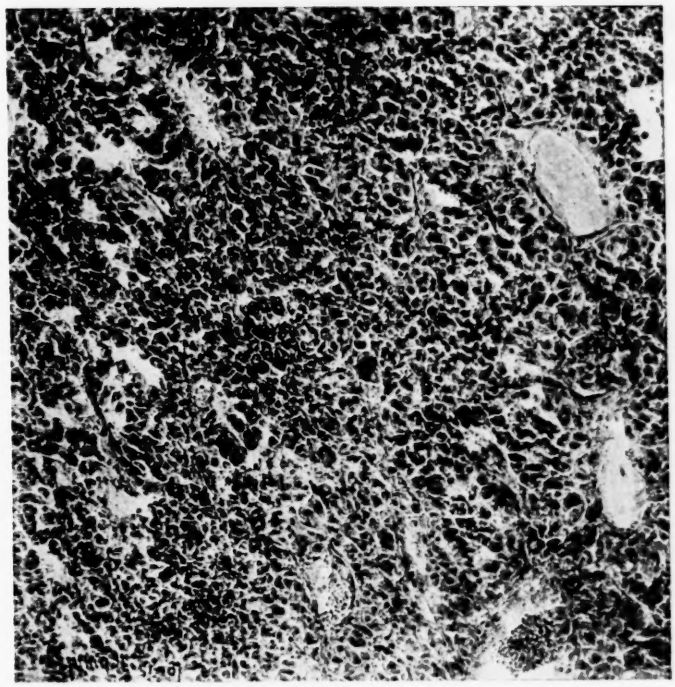

Fig. 4.—Original tumor—from kidney.

Fig. 1.—From juice of adrenal cortex of guinea-pig seen with crossed Nicol's prisms. The globules with the black crosses are the double refracting myelin globules—the rest are fatty globules (isotropous). Sketch of appearances seen with the high power (Leitz, 1/7 in.)

Fig. 2.—Human liver juice, expressed from piece of liver tissue acted on for 12 hours by absolute alcohol. Large double refractive globules are seen under the crossed Nicol's prisms, along with abundant fatty globules.

Fig. 3.—The myelin processes formed by the action of ammonia on oleic acid, seen under the polarization microscope with crossed prisms.

Fig. 5.—From the same material as Fig. 2, after five days. The myelin globules were in coherent masses (from partial evaporation of the alcohol?). They exhibit well-marked distortion.

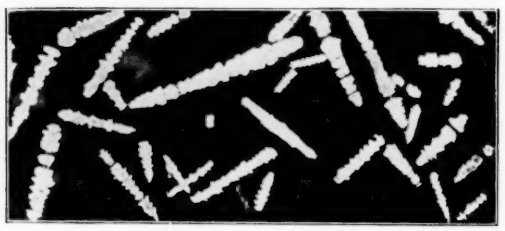

Fig. 4.—Flowing or ductile crystals or azoxybenzoic acid ethylester (after Lehmann). Cholesterin oleate is apt to exhibit very similar figures.

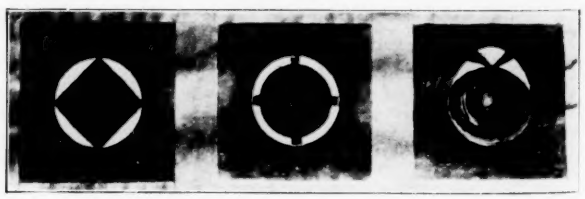

Fig. 6.—Aberrant forms of the myelin globules of human adrenal, seen under the crossed prisms of the polarization microscope.

ILLUSTRATING ARTICLE BY DR. ADAMI (See pages 463 to 469).

A REMARKABLE CASE OF CARCINOMA OF THE GALL-BLADDER IN A MAN TWENTY-TWO YEARS OLD.

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The occurrence of carcinoma in individuals between the ages of 15 and 30 years has been positively established by observations within the last two decades. I shall not speak of congenital carcinoma or that occurring in early childhood.

The statistics of Bürger founded on 15,134 autopsies, give 39 cases (25 per cent.) of carcinoma in persons between the ages of 15 and 30 years. None under 15 years are given. De la Camp, in 9,926 cases of carcinoma, found that the patients in 19 or 0.18 per cent. were under 20 years of age. Lubarsch, in 563 cases, found 4 patients between the ages of 14 and 19; 5 between 20 and 25 years and 3 between 26 and 29. Of 527 autopsies on carcinoma cases by Glaser one subject was 20 years of age and 16 were 30 years of age. Of 325 autopsies on carcinoma cases recorded by Borst one subject was between 11 and 20 years and 2 were between 21 and 30 (.92 per cent.). The percentage therefore varies within wide limits between 0.18 per cent. (De la Camp) and 3.22 per cent (Glaser). The average in the 5 series of statistics is 0.87 per cent. Of all cases of carcinoma reported but 1 per cent. appeared before the age of 30.

The organs most frequently affected in young individuals are: The rectum between the thirteenth and the twenty-fifth years and in some cases even earlier—(Billroth, Bürger, De la Camp, Gurlt, Glaser, Czerny, Port, Sehöning). The stomach is seldom affected before the thirtieth year, but De la Camp, Hofmann, Muth and Borst have recorded cases at the ages of 14, 16, 18, 20, respectively. Ovaries have been found affected at the ages of 17, 19 up to 30 years (Bürger, Malibert, De la Camp, Leopold). The uterus not infrequently between 20 and 30 and in exceptional cases (Bürger, Eckardt, Glaser, Beigel) as early as 17, 19 and 20 and up to 30 years. Further, cancer of the vagina has been found as early as the fifteenth year (Brückner, Küstner) and up to the twentieth and thirtieth year. The skin has been affected at the ages of 23 to 27 (Pierre, Andouard). The appendix at 17, 19, 24, 30 (Kelly, McBurney, Adam).

I report a case of carcinoma of the gall-bladder in a man of 22 years, to my knowledge the first case recorded at so early an age, the youngest patient previously reported (Kaufmann) being a woman, aged 35, in whom gallstones were also present. The case I now report is especially interesting for three reasons: 1. The individual was a male. In men carcinoma of the gall-bladder is much rarer than in women.[1] 2. From the etiologic standpoint, no gallstones, which are supposed to play an important part in the formation of carcinoma of the gall-bladder, were found. 3. From the clinical standpoint, a relatively benign course of the disease.

Many authors (Bollinger, Marchand, Klebs, Zenker, Musser, Fütterer) look on gallstones as a primary cause of carcinoma of the gall-bladder; 79.7 per cent. of 74 cases recorded by Tiedemann showed an existence of gallstones. Janowski found stones in all 40 cases which had come under his observation. Siegert found gallstones in 31 cases of 39 and Fütterer found same condition in 78 per cent. of 268 cases.

Patient.—A. D., Italian, laborer, aged 22, was admitted to Mercy Hospital, May 13, 1906.

History.—Patient had typhoid fever 10 years ago. For past 3 months patient has had indigestion and pain in epigastrium. Pain lasted three to four hours, then passed away. Bowels were constipated. Patient was jaundiced.

Examination.—Patient was fairly well nourished. Temperature was normal; pulse, 90, regular and good volume; respiration, 20. Tongue was coated. Sclera was slightly yellow. Heart and lungs were negative.

Abdomen: There was a mass in epigastrium size of orange, slightly to right of the median line. Mass moved with liver and respiration. There was tenderness over mass.

Clinical diagnosis: Cholecystitis.

Operation.—By Dr. Acheson Stewart. Incision was made in the median line. Gall-bladder the size of an orange was found, adherent to abdominal wall. The gall-bladder was very friable and its cavity filled with pus. Mass was dissected free as far as possible, ascendently fixed, partially excised and remainder packed; two pieces of gauze were used, one in the gall-bladder, the other in the abdominal cavity. Convalescence was uneventful. Patient was discharged June 7, 1906. Small granular surface at incision.

Examination of Tissue Excised.—Gross appearance. This consisted of a section of tissue the size of a walnut, grayish-white in color, of semi-solid consistency infiltrated by yellowish striated, isolated small round and oblong masses.

Microscopic Examination: Under weak power: The gall-bladder wall consisted mainly of connective tissue with some non-striated muscle fibers. Throughout the field were infiltrations of small round carcinoma cells which in some places were massed in groups, in other places diffused, the latter areas very vascular, containing leucocytes, lymphocytes, and many fibroblasts. Where the carcinomatous infiltration was great the connective tissue had undergone hyaline degeneration, some places still responding to stains, others appearing clear and transparent, with no affinity for stains.

Under high power: The carcinoma cells were more or less uniform in size with roundish or oblong, strongly chromatized nuclei, surrounded by a narrow mass of protoplasm. The protoplasm was of absolutely homogeneous structure, in some places finely granular and weakly basic. Mitosis was shown but very little. In the center of the carcinoma cell masses are found all kinds of katabiotic changes, karyolytic degeneration of chromatin, etc. In many places the carcinoma cells had undergone colloid degeneration, the protoplasm was swollen, nucleus flat and periphery compressed. (Fig. 1.) In the beginning of colloid degeneration the protoplasm of the carcinoma cells took weak (acid) anilin dyes; with further degeneration this property was lost. The degenerated cells had run together and formed round light areas (Fig. 2), producing a honeycomb appearance, giving the impression that the cancer cells had been lost. The frame of the honeycomb consisted of a hyaline branching mass in which the flat nuclei of the degenerated cells were deposited. That the carcinoma had undergone colloid degeneration was shown by the fact that some of the alveoli were still filled with perfect carcinoma cells. Where the carcinoma cells were diffused the connective tissue also presented a homogeneous mass of colloid degeneration which was partially absorbed and partially (shown under freezing) fatty degenerated. (Fig. 3.) Whether it was fatty infiltration or degeneration could not be positively ascertained; most likely it was infiltration. Differential diagnosis lay between carcinoma, sarcoma, granulation tissue, specific (tuberculosis, syphilis) or simple. Under weak power it first appeared to be a round-celled sarcoma, in some places diffusely infiltrated, in others the alveolar variety. Under stronger power and stained according to Van Gieson as modified by Mallory an intercellular substance between the carcinoma cells could not be demonstrated. Also in the diffused places the carcinoma cells were arranged in longitudinal

1. According to Dr. Bollinger, the ratio is 80 women to 20 men. In 99 cases of primary gall-bladder cancer 85 were women and 14 men (Siegert). Tiedemann recorded 88.7 per cent. women and 11.3 per cent. men. On account of lacing, women suffer much oftener than men. Bollinger found corset livers in 33 per cent. to 40 per cent. of gallstone cases.

strata between the connective tissue. The Van Gieson stain showed the absence of intercellular substance. The absence of the finely (threadlike) or finely granular intercellular substance was the most important differential point between sarcoma and carcinoma. The morphology was also different. The spheroidal carcinoma cells on cross section were of uniform size, while the cells of sarcoma appear of various sizes and shapes on cross section. Still less could it be taken for plastic granulation tissue which is traversed by rich capillaries and contains embryonic connective tissue cells (fibroblasts), leucocytes and lymphocytes. The tumor in some places had such an appearance, but the carcinomatous areas were sharply defined from the granulation tissue. Tuberculosis and syphilis were excluded as the tubercle bacilli and spirochetes were not found. The above carcinoma may be designated carcinoma globocellulare colloides (or endothelio-carcinoma?).

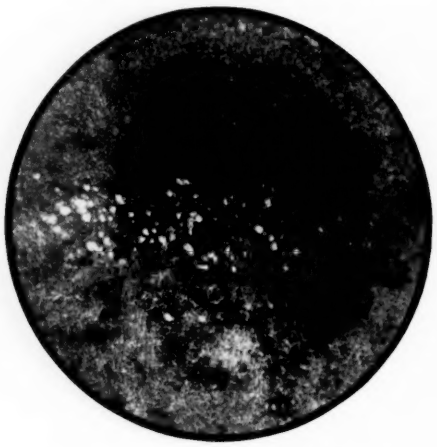

Fig. 1.—Section through the thickened gall-bladder wall (lower power, Zeiss objective 16 mm., ocular 4). Showing the infiltration with carcinoma cells and colloid degeneration.

Probably the carcinoma originated in the lining epithelium of the gall-bladder. This cannot be positively ascertained since the specimen excised had no mucous membrane. It is possible that the primary seat was in the endothelium of the lymph vessels. The above variety is seldom found in the gall bladder, more generally we find adenocarcinoma, then scirrhus and medullary forms. Squamous epithelioma occurs very seldom (metaplasia of mucous membrane from columnar to squamous epithelium takes place).

Fig. 2.—Section through the thickened gall-bladder wall (higher power, Zeiss objective 8 mm., ocular 4). Showing the middle carcinoma cell-nest in the center beginning necrobiosis of the carcinoma cells.

A remarkable feature was the small morphologically indifferent structure of the carcinoma cells. I shall also report a case of carcinoma of the appendix in a man, aged 30. Microscopically it is identical with the specimen from the gall bladder.

It is possible that the exciting cause of the carcinoma was the cholecystitis, moreover, that pus was found in the gall-bladder. The inflammation is presumably not to be considered the direct cause of carcinomatous degeneration but it is more likely to be attributed to secondary causes.

The parasitic origin can be absolutely excluded as all most painstaking thin paraffin preparations and staining methods gave negative results. Another interesting feature was that at the operation metastasis could not be found, even the portal lymph glands were not enlarged. We deal, therefore, with a purely local carcinoma which clinically and microscopically gave no evidence of metastasis. It can be likened to skin carcinoma which affects distinct areas without tendency to metastasis.

From a pathologic standpoint the benign course of this carcinoma is very important because it shows that cancer is primarily a local affection and may remain so for some time. Why metastasis should be absent in these cases is so far a question, the answer to which may aid greatly the therapy of carcinoma. Theoretically, it may be assumed that the organism becomes immune to metastasis either through histogenic or serogenic influences; if the latter, the carcinoma cells become destroyed cytolytically in the blood serum or, which is the most likely, the fixed cells and not the blood stream insure the immunity against secondary metastasis.

Fig. 3.—Diffuse colloid degeneration with some well-preserved carcinoma cells (higher power, Zeiss objective 8 mm., ocular 4).

Postoperative observation for several weeks shows that although the greater part of the diseased gall-bladder was left in the abdomen there is no tendency to metastasis. The patient feels well physically and is gaining in weight. The periodical pains experienced prior to operation are gone.

In conclusion a question arises whether the carcinoma became stationary and is capable of healing. Theoretically, according to Virchow, the spontaneous healing of cancer is not improbable. Within the last few years cases have been reported in which positive diagnosis of carcinoma was established microscopically and in which, inspite of incomplete removal of same, recovery took place. I refer to cases of A. Senger[2]

2. "Ueber die spontane Heilbarkeit des Carcinoms," Chirurgen Kongress, 1894-1903, No. 12.

and H. Mohr.[3] Both speak of healed carcinoma of the buccal mucous membrane. Furthermore, Alsberg, Kroenlein, Steudel, Linduer, Hahn and Baer reported cases of stomach carcinoma in which after a simple gastroenterostomy was performed the tumor subsided and in some cases completely disappeared. Nusbaum suggested that the relief of hyperemia and removal of irritation not only acts as a prophylactic agent, but may also retard the development of carcinoma. It is possible that my case may belong to this class. Through the emptying of the gall-bladder of the inflammatory products and irritation and hyperemia

Fig. 4.—Section through the shrunken remaining gall bladder, hyaline sclerotic degeneration of the fibrous and muscular tissue (lower power, Zeiss objective 16 mm., ocular 4).

being removed, recovery is not improbable. I hope to keep the patient under observation and report again the further course of the disease.

Additional Notes.—Since writing the above further observations on patient have been made. On August 19, about 13 weeks after the first operation, the patient presented himself at the hospital. He had felt perfectly well during the entire

Fig. 5.—Section through the fibrous capsule of the remaining gall bladder, showing well-preserved carcinoma cell-nests with beginning necrobiotic changes of the cells (higher power, Zeiss objective 18 mm., ocular 4).

period since his discharge. A small fistula still remained at the site of incision, and through this, by means of a probe, a gall-stone could be felt. A second operation was decided on.

Operation.—By Dr. A. Stewart. Incision was made parallel to scar. On opening the abdominal cavity the gall-bladder was found very much shrunken, from the size of an orange to a mass 5 c.m. long and half the thickeness of a finger. The distal end was adherent to the peritoneum and contained in its small cavity a cholesterin stone about the size of a pea. The stone was very likely formed after the first operation from the incrustations of dead epithelium and cholesterin. The gall-bladder was tied off, extirpated and the abdomen closed. A careful palpation of the liver as well as of the peritoneal cavity showed no metastasis.

The remains of the gall-bladder are of fibrous consistency and the superficial covering very red. On cross section two distinct tissues are recognized; a grayish-white oval mass about one and one-half centimeters in diameter with a very small lumen in its center and surrounded by a tough fibrous capsule.

Microscopic Appearance.—(Eosin hematoxylin stains). The gray oval mass (Fig. 4) consists of hyaline sclerotic connective tissue, pure in nuclei, and remnants of a few smooth muscular fibers. In the center is the lumen which is lined with a flat endothelium (remnant of the gall bladder cavity). Under high power there can be seen in the hyaline sclerotic masses multitudes of necrobiotic carcinomatous cells. In some cells a part of the nucleus is still visible; the majority lack that and present only a light blue stained mass on the diffuse red underground. In the fibrous capsule, which is very vascular, the found roundish oval nests (Fig. 5) filled with carcinoma cells; the latter are in the majority nearly normal and of a dark blue color. On the other hand, there are also found in the center as well as periphery of the nest necrobiotic carcinoma cells. The nucleus is swollen and its staining property is almost lost; the protoplasm is broadened and stained a weak reddish blue. Fibroblasts are seen in large quantities, compresing and drawing together the nests.

The supposition that the removal of the inflammatory irritation may bring about the healing of carcinoma seems very probable. As is seen microscopically the gall-bladder shrank together and the carcinomatous masses underwent (with some exception) colloid degeneration; only in the outer fibrous capsule where the vascularization was so rich, were there still some carcinomatous nests, nourished and kept living; but even there the necrobiotic changes of the carcinoma cells have begun. They perish either through poor nourishment or the invasion of the fibroblasts which compress them.

It is logical to suppose that without extirpation the carcinoma would have degenerated and disappeared. We can therefore admit the interesting fact of the spontaneous healing of a carcinoma (which was positively diagnosed microscopically). This case shows that even in advanced cancer when the organism has sufficient fighting endurance recovery is still possible. At this time, however, we are not as yet capable of understanding the fine mechanism of this process in order to utilize it and to benefit the therapy of inoperable carcinoma.

3. Therapeutische Monats., 1903, No. 12.

EXPERIMENTAL CHRONIC NEPHRITIS.*

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From the slight mention which experimental work on chronic nephritis receives in our text-books and even in more exhaustive monographs on renal diseases it would seem that the result of experimentation conducted with the object in view of reproducing chronic Bright's disease and of elucidating some of the many obscure problems connected with it has been unsatisfactory. Ziegler[1] states very positively:

Die Experimentaluntersuchungen über Nephritis . . . lassen sich für die Pathologie der bei dem Menschen vorkommenden Nephritis nur in sehr beschränktem Maasse verwenden.

* From the Pathological Laboratory of Cooper Medical College.
1. Ziegler: Lehrbuch, eighth edition, 1895, p. 754.

Similar remarks may be found in other publications relating to the same subject,[2] and yet a careful review of the literature shows that, although experimental research so far fails to furnish a full explanation of all conditions which in man are associated with this disease, the authors seem to underestimate the importance of what really has been accomplished. The number of instances is not so very small in which experimenters have succeeded in the reproduction of the essential lesion: chronic interstitial nephritis even with marked shrinkage of the kidneys. From our experience in man we must assume that the other disturbances which usually accompany chronic nephritis would have followed in due course had the experiments been continued for a sufficient length of time. This, to my mind, is very clearly shown by Ehrlich's[3] and Levaditi's[4] experiments with vinylamin. Vinylamin does not affect the renal cortex, at least when it is used in sufficiently small doses,[5] but produces an extensive necrosis of the papilla. If the animals (mice were used mostly) survive the injection, extensive lesions in the cortex naturally follow which eventually cause considerable contraction. In such animals the usual sequelæ of chronic nephritis;

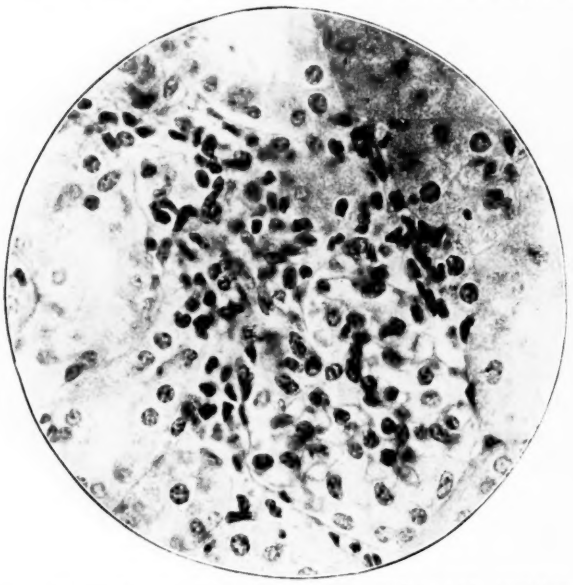

Fig. 1.—Beginning interstitial inflammation and invasion of glomerulus in guinea-pig No. 2. Flemming. Saffranin. High power.

marked edema, hypertrophy of the left ventricle and even retinitis albuminuria were observed repeatedly. This would seem to indicate very plainly that, in whatever way the lesions of the cortex are produced, the other symptoms of chronic Bright's disease follow if there is time enough for their development and if the lesions of the cortex are severe enough. The result of Pässler's and Heineke's experiments[6] is also interesting in this regard. They reduced the renal cortex in dogs very considerably (less than one-half) by operation and prevented the occurrence of the usual compensatory hypertrophy by subsequent operative interference. They found in those animals which survived long enough and which did not develop a cachectic condition a considerable rise in blood pressure followed by hypertrophy of the left ventricle. They did not, however, observe any edema nor symptoms of uremia.

In the following I shall give a brief review of what data I have been able to collect from the literature in regard to the experimental production of chronic nephritis by poisons which directly affect the renal cortex. I shall treat only of those of which it has been reported that they produce interstitial changes.[7] These are aloin, boracic acid, cantharidin, potassium chlorate, chromic acid and the chromates, lead and other heavy metals, oxalic acid and oxamid, sulphuric acid and various bacterial toxins.

Aloin.—The effects of aloin on the kidneys were studied by Kohn[8] in 1882. Microscopically he found de-

Fig. 2.—Section of renal cortex of guinea-pig No. 5, showing contracted area of chronic nephritis. Low power. van Gieson.

generative processes and necroses in the epithelium, but no interstitial changes. Mürset[9] had very similar results, but in addition found areas of cellular infiltration; in one case even beginning atrophy of the tubules as a result of the thickening of the connective tissue.

Borax.—It has lately been maintained by Harrington[10] that by feeding cats for some time (133 days) food containing considerable doses of borax he had produced marked renal lesions not confined to the epithelium, but involving the interstitial tissue extensively. His results,

2. See Lyon: "Inflammatory Changes in the Kidney: An Experimental Study of the Action of Some Toxins and Poisons on the Kidney and also on the Spleen," Jour. Path. and Bact., 1904, ix, 400. Lyon says: In no case and by no variation of the experimental method have I been able to produce and follow the evolution of changes at all analogous to those which we find in subacute and chronic diffuse nephritis in man.

3. "Ueber den Zusammenhang von chemischer Constitution und Wirkung," Leyden's Festschrift, 1898, p. 647.

4. "Experimentelle Untersuchungen über die Necrose der Nierenpapillæ," Arch. int. de Pharmacodynamie, 1901, viii.

5: Levaditi explains Lindemann's observations to the contrary. Lindemann: "Sur le mode d'action de certains poisons rénaux." (Ann. de l'Inst. Past., 1900, xiv, p. 49) by assuming that he either used too large doses or employed a deteriorated preparation.

6. Verh. der Deutsch. Path. Gesell. Meran, 1905.

7. It has been repeatedly asserted from theoretical considerations that all substances which have an irritative effect on the kidneys should, if employed long enough, cause chronic renal disease with interstitial lesions. Experimentally, there is much to support such a view, still it also would appear from the experimental evidence at hand that certain substances affect the interstitial tissue more strongly than others. It is these that we treat of here.

8. "Beitrag zur Wirkung der Aloë," Berlin klin. Woch., 1882, xix, p. 68.

9. "Untersuchungen über Intoxicationsnephritis," Arch. f. Path. u. Pharm., 1885, xix, p. 310.

10. "Borated Food as a Cause of Lesions of the Kidneys," Am. Jour. Med. Sci., 1904, p. 418.

if confirmed, should have considerable influence in shaping pure-food legislation.

Cantharidin.—Cantharidin has been used very much more extensively[11] in experimental work of this kind. The principal renal lesion in this form of poisoning is a glomerulo-nephritis which has been carefully studied by Cornil,[12] Eliaschoff[13] and Welch.[14] In 1882 Aufrecht[15] observed a typical contracted kidney with marked macroscopic lesions in a rabbit (experiment No. 8) that he had given 25 subcutaneous injections of cantharidin in the course of 4 months. Of the microscopic picture he says:

Interstitien ausserordentlich stark verbreitert, in denselben zahlreiche grosse ovale und rundliche Kerne.

Another rabbit, however (experiment No. 9), treated similarly for 3 months did not show any lesions in the interstitial tissue. Similarly varying results were obtained by Germont.[16] In one of his guinea-pigs he found interstitial lesions, although they were not so marked as in Aufrecht's case; in a rabbit they were absent. Lyon[2] also used cantharidin for part of his experimental work. He failed to produce chronic progressive lesions, still in some instances he saw areas of cellular infiltration around veins.

Fig. 3.—Subcortical area of chronic nephritis in dog No. 1. Low power. van Gieson.

Potassium Chlorate.—The most important change observed in acute and chronic potassium chlorate poisoning, as is well known, is a marked decomposition of the blood with the production of methemoglobin and intense pigmentation of the kidneys. There is more or less degeneration of the epithelium. In a case of this form of poisoning in man with death 12 days after ingestion of the poison Marchand[17] found small areas of cellular infiltration in the kidneys.

Chromic Acid.—Striking results were obtained from the very first with chromic acid and its salts. Soon after Gergens[18] had discovered that the absorption of this substance caused a very marked acute nephritis, its effects on the kidneys were very carefully studied by Kabierske,[19] who in chronic intoxications found cellular infiltration around the blood vessels after the sixth day and beginning proliferation of the cells of the interstitial tissue. Repeated subcutaneous injections of small doses were followed by marked thickening of the interstitial connective tissue.[20] Kabierske's results were confirmed by Pander,[21] who found that in his experiments the interstitial infiltration began in the second week and was marked after 3 to 4 weeks. In 1892 von Kahlden[22] made a few experiments with chromic acid on rabbits and dogs, the longest one lasting 14 days only. Naturally he was unable to demonstrate any interstitial lesions. Similarly Burmeister,[23] confining his researches to the more acute stages, found only a very moderate proliferation of the interstitial tissue.

Lead.—The literature on experimental lead poisoning is very large. Many papers, however, do not refer to the renal complications or if they do so only incidentally. I mention only those papers which are most important in regard to the renal lesions. That chronic nephritis is a frequent complication in chronic lead poisoning in man and also that albuminuria and renal lesions can be produced in animals by the introduction of lead in various forms has long been recognized. In experimental lead poisoning, as in other intoxicants, the occurrence of

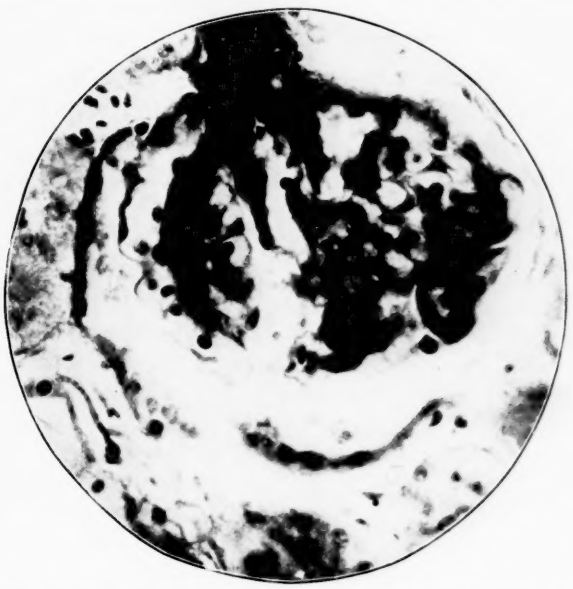

Fig. 4.—Glomerulo-nephritis in dog No. 3. van Gieson. High power.

11. Only those papers which have a direct bearing on the question under discussion are mentioned.

12. Jour. de l'Anat. de Robin, 1880; also Cornil and Brault: "Etudes sur la Pathologie du Rein," Paris, 1884.

13. "Ueber die Wirkung des Cantharidin auf die Nieren," Virch. Arch., 1883, xciv, 323.

14. "Experimental Study of Glomerulo-Nephritis," THE JOURNAL A. M. A., 1886, vii, p. 49.

15. "Die Schrumpfniere nach Cantharidin," Centrbl. f. die med. Wiss., 1882, xx, 849; also "Die Nephritis nach Cantharidin," Path. Mitt., ii, 1883, p. 19.

16. "Contribution a l'Etude Expérimentale des Nephrites," Thèse de Paris, 1883.

17. "Ueber Intoxication durch chlorsaure Salze," Virch. Arch., 1879, lxxvii, p. 455.

18. "Ueber die toxische Wirkung der Chromsäure," Arch. f. exp. Path. u. Pharm., 1876, vi, p. 148.

19. "Die Chromniere," Diss., Breslau, 1880.

20. As the lesions in acute poisoning and the initial lesions in chronic poisoning were entirely epithelial, Weigert, who studied Kabierske's specimens, regarded his work as an experimental confirmation of his views of the primary character of the epithelial lesions in chronic nephritis in man.

21. "Arbeiten des pharmak.," Instituts zur Dorpat, ii, p. 1.

22. "Die Aetiologie und Genese der akuten Nephritis," Ziegler's Beitr., 1892, xi, p. 441.

23. "Beitr. zur Histogenese der acuten Nierenentzündungen," Virch. Arch., 1894, cxxxvii, p. 405.

parenchymatous lesions in the kidneys was first observed (by Cornil, for instance, as early as 1863). In 1880 Raimondi[24] found in guinea-pigs that had been given lead for some time signs of beginning chronic nephritis, and soon afterward Charcot and Gombault[25] published their very important contribution to the subject of chronic experimental nephritis. They mixed with bran, which was part of the feed of their guinea-pigs, very small doses of carbonate of lead. From time to time they stopped the administration of lead entirely. In this way they succeeded in keeping some of their animals alive for a considerable time (3 months to 1 year), and in them observed renal lesions which certainly resemble those found in chronic nephritis in man very closely. With their paper they give very convincing plates showing the granular appearance of the kidneys on the surface and pictures of sections with marked interstitial changes in the usual distribution. Even if we do not agree entirely with the theoretical deductions which they draw from these experiments, namely, that the condition is what they term a cirrhose épitheliale, that is, that the epithelial changes are primary, we must still acknowledge the

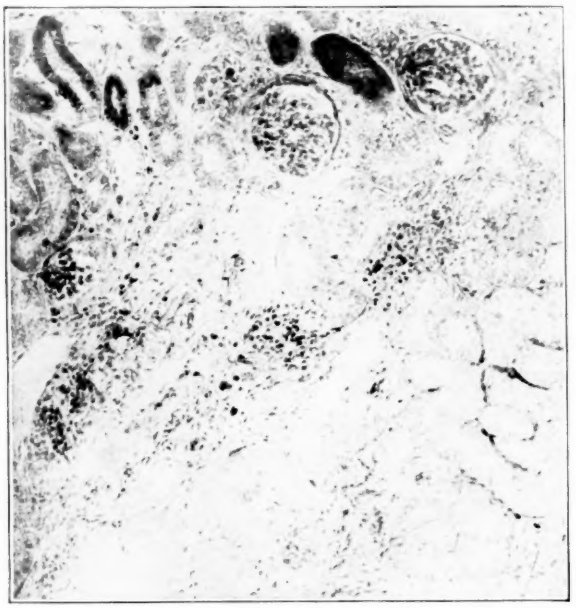

Fig. 5.—Beginning interstitial inflammation in bichromate dog. Flemming, Saffranin. Low power.

great value of their investigation in demonstrating in the first place the possibility of the experimental production of very definite chronic nephritis and also the direct relation of lead to this process. It is of some interest to note that in none of their experiments they were able to detect any albumin in the urine of the diseased guinea-pigs. Hoffa[26] had similar, although not so marked results, with lead acetate in rabbits. He also noted an early hyperplasis of the connective tissue. In 1883 Ellenberger and Hofmeister,[27] in studying the effect of lead in ruminants, found a diffuse nephritis in sheep. Coen and d'Ajutolo's[28] investigations are confirmatory in so far as they observed areas of cellular infiltration in the kidneys of rabbits which had been under the influence of lead given in small doses for considerable time, to 155 days, but they failed to produce any typical contracted kidneys. They remark, however:

Es ist höchstwahrscheinlich, dass bei längerer Einwirkung des Giftes auch bei unseren Versuchstieren sich eine indurative Atrophie, eine echte Nierencirrhose würde herausgebildet haben.

Prévost and Binet[29] did not get any striking results in guinea-pigs with lead acetate, but of their series of experiments with carbonate of lead, also given to guinea-pigs, some of which survived for a little more than a year, they say:

Lésions renales très accentuées chez la plupart d'entre eux, surtout quand l'intoxication avait duré longtemps.

Rats treated in the same way showed similar lesions. Oliver[30] and Stieglitz[31] were not so successful, probably because their animals did not survive so long; still they noticed areas of cellular infiltration in the later stages. Annino[32] did not observe any interstitial changes, but Hirsch[33] and Paviot[34] again called attention to the occurrence of a productive interstitial nephritis. It is remarkable that the two latest papers on this subject should be so much at variance with former observations. Oppenheim,[35] who experimented on rabbits with subcutaneous injections of lead acetate in small doses, did not notice any changes in the kidneys. His work, however, is largely chemical and does not contain any records of microscopic investigation. Jores,[36] on the contrary, made a very careful microscopic study of the kidneys in his cases. Although all his animals (rabbits) lived for over two months and one of them for 14 months and 20 days, he remarks:

Die interstitiellen Processe kommen beim Kaninchen erst sehr spät zur Ausbildung. Von geringen Herden abgesehen, bin ich Wucherungen des Bindegewebes nur einmal begegnet, bei dem Tier welches die längste Untersuchungsdauer hat. Auch hier lag keine der menschlichen Schrumpfniere analogen Verbreiterung des wuchernden Bindegewebes vor, sondern der Process beschränkte sich auf einen narbigen Herd in einer Niere.

Heavy Metals.—In regard to the influence of heavy metals, in general, on the kidneys, some remarks of Kobert[37] on what he calls "die Metallniere" are very suggestive. He showed that mangan, iron, nickel and cobalt which are very poorly absorbed from the intestines, produce a marked acute nephritis on subcutaneous injection. If the administration is discontinued the process heals promptly. In a case of chronic experimental manganpoisoning, however, he observed a more chronic form of nephritis with new formation of connective tissue and even secondary contraction.

Mercury.—Although acute mercury poisoning may give rise to a very marked acute nephritis with necrosis and calcification of the epithelium in man and in the lower animals, it apparently does not lend itself very

24. "Degli avvelenamento lenti di arsenico, mercurio e piombo," etc., Ann univ. de Med., 1880, sixty-sixth year, ccii, 52.
25. "Note rélative à l'étude anatomique de la nephrite saturnine expérimentale," Arch. de Phys., 1881, second series, viii, 126.
26. Ueber Nephritis saturnina., Diss. Freiburg, 1883.
27. "Zur physiol. Wirkung und Deposition der Bleisalze bei Wiederkäuern," Ber. f. d. Veterinärwesen in Sachsen, 1883, II.
28. "Sulle alterazioni istol. dei reni . . . nell' avvelenamento cronico da piombo," Ziegler's Beitr., 1888, vii, p. 480.
29. "Recherches exp. sur l'intoxication saturnine," Rev. de la Suisse Romande, 1889, ix, pp. 606, 669.
30. "Lead Poisoning in Its Acute and Chronic Manifestations," Lancet, 1898, lxix, i, pp. 530, 588, 644.
31. "Eine experimentelle Untersuchung über Bleivergiftung," etc., Arch. f. Psych. und Nervenkrank, xxiv, 1892, p. 1.
32. "Avvelenamento cronico da piombo," Arch. Ital. di Clin. Med., xxxii, Rev. in Virchow Hirsch Jahresberichte, 1894.
33. "Experimentelle Untersuchungen zur Lehre von der Bleiniere," J. D., Leipzig, 1891.
34. "Pathogénie des lésions rénales dans le saturnisme," Gaz. hebdomad., 1886, new series, i, 544.
35. "Zur Kenntniss der experimentellen Bleivergiftung," J. D. Berlin, 1898.
36. "Ueber die pathologische Anatomie der chronischen Bleivergiftung des Kaninchen," Ziegler's Beitr., xxxi, 1902, p. 183.
37. "Zur Pharmakologie des Mangans und Eisens," Arch. f. experim. Path., 1883, xvi, 361.

well to the production of any lesions resembling those found in chronic Bright's disease in man. This was at least Lyon's[2] experience. He reports very slight, if any, interstitial changes.

Oxalic Acid.—Oxalic acid, besides being deposited in the kidneys in large quantities, is known to cause considerable renal irritation, slight epithelial lesions, but apparently no effect on the interstitial tissue. It is somewhat surprising, therefore, that Ebstein and Nicolaier[38] announced at the Congress for Internal Medicine at Wiesbaden, in 1892, that they had succeeded in producing typical contracted kidneys in two dogs by feeding them small doses of oxalic acid and oxamide for 169 and 304 days, respectively. I have not been able to find their more extensive publication which they announce, nor have their experiments been confirmed so far as I know, which would be very desirable, as the number of them is so small and as it is well known that dogs not so infrequently suffer from spontaneous chronic nephritis.

Sulphuric Acid.—In regard to the effect of sulphuric acid on the kidneys, I should like to confine myself to a short reference to Fränkel and Reiche's[39] paper which shows that in this form of poisoning degenerative changes in the epithelium are common and slight interstitial changes may be observed occasionally.

Bacterial Toxins.—As acute infectious diseases are frequently followed by acute nephritis which fortunately usually heals—completely so far as we know—but which may occasionally terminate in chronic nephritis (in cases of scarlet fever, for instance) the experimental study of the effect of bacterial toxins on the kidneys has suggested itself to many authors. Pernice and Scagliosi[40] describe the occurrence of glomerulitis and consecutive nephritis in animals following injections of living bacterial cultures and bacterial toxins. According to their idea, the process begins in the circulatory apparatus with endarteritis, followed by disturbances in circulation and hemorrhages. Later, changes occur in the Malpighian bodies and the epithelium of the tubules. In still later stages there may be collapse of the tubules, simulating thickening of the interstitial tissue. Morse,[41] under Councilman's direction, made similar experiments. In only 3 out of a number of experiments he found areas of cellular infiltration. He argues:

> **It must be admitted that the human kidney is more or less constantly exposed to the action of chemical substances produced by bacteria. Hence it would seem justifiable to assume that a certain proportion of the cases of chronic nephritis in man may be due to the action of such substances.**

Lyon,[2] in experimenting with diphtheria toxin, observed hemorrhages, degeneration of the epithelium, later areas of cellular infiltration around the blood vessels, but, although he continued the injections for months, he could not produce any fibrous change. Other investigators, however, describe much more marked lesions in animals which had been under the influence of this substance. It would lead us too far to attempt a complete review of the literature[42] of this part of our subject. Suffice it to say that, however interesting these experiments may be and however plainly they may show that bacterial toxins may produce chronic renal disease, the enthusiastic belief of some that all cases of chronic Bright's disease in man or even the majority should be explained on this basis seems hardly warranted. All experimental data show plainly that in order to produce chronic nephritis the action of the poison on the kidneys must be long continued, otherwise the lesions heal, and if considerable tissue is lost it is made up for by compensatory hypertrophy. As in most infectious diseases in case of survival the infectious agent which furnishes the poison is completely destroyed after a while, the production of toxin must necessarily stop and with that the possibility of the development of a progressive chronic renal disease. All that may remain is a certain vulnerability of the kidneys, but even this occurrence has never been proved absolutely.

38. "Ueber experimentelle Erzeugung von Schumpfnieren durch Oxalsäure-Oxamidfütterung," Verh. des Cong. f. Inn Med., Wiesbaden, 1892, xi, p. 318.

39. "Ueber Nierenveränderungen nach Schwefelsäuerevergiftung," Virch. Arch., 1893, cxxxi, p. 130.

40. Beitrag zur Aetiologie der Nephritis (Experimentelle Nephritis von bakterischem Ursprung), Virch. Arch., 1894, cxxxviii, 521.

41. **"Changes Produced in the Kidneys by the Toxins of the *Staphylococcus pyogenes aureus*,"** Jour. Exp. Med., 1896, i, p. 613.

42. In regard to this see Asch, P.: "Ueber den Einfluss der bacteriellen Stoffweckselproducte auf die Niere," Strassburg, 1904, published by L. Beust.

AUTHOR'S EXPERIMENTS.

For my own experiments I first selected lead because it is the only substance of which we know with any degree of certainty that it produces chronic nephritis in man. In all my experiments I gave the poison by mouth because this mode of administration came closer to what occurred under natural conditions. In an attempt at reproducing a disease of such chronicity the smallest possible doses had, of course, to be employed; not too frequently, in order not to kill the animals prematurely nor even to interfere too much with their general nutrition. In the case of lead it was easy to determine by blood examination whether the doses were large enough to produce any appreciable effect. Even after the very small doses which were employed the well-known lead anemia promptly developed. As it seemed that after a while the animals became accustomed to the metal, to a certain extent, the doses were slowly increased; still they were never very high. The severe changes which resulted from the administration of a few grams of lead in the course of a year or so are certainly a renewed proof of the extreme toxicity of this metal and a renewed strong argument in favor of very strict protective legislation with the object in view to prevent not only accidental lead poisoning, but also the introduction with the food of any substances which might have an irritating effect on the kidneys. The anemia after a while assumed the character of a pernicious anemia with marked decrease in the number of erythrocytes, with the appearance of many macrocytes and microcytes and some poikilocytes in the peripheral circulation. The nucleated red blood corpuscles were very numerous and many of them were of the megaloblastic type. At autopsy the bone marrow resembled that found in pernicious anemia macroscopically. It contained an immense number of nucleated red cells, among them many megaloblasts. The liver and especially the spleen and the kidneys also were full of hemosiderin. The changes were very much like those which can be experimentally produced by toluylendiamin. This extreme anemia was the greatest obstacle encountered in the attempt at continuing the experiments for the desired length of time.

RESULTS OF EXPERIMENTS ON GUINEA-PIGS.

The following is a short record of the result of these experiments. They were conducted according to the method of Charcot and Gombault. Small doses of carbonate of lead were mixed with bran. Guinea-pigs were fed on greens and the poisoned bran on alternating days. Two guinea-pigs were in one cage. In the beginning of the experiments 1 grain of carbonate of lead

was put into the bran, later 2 and 3 grains. An exact dosage is, of course, impossible in this way. The experiment was started Dec. 10, 1905, with 6 guinea-pigs. Four of these guinea-pigs have so far been examined, one after 2 months, two after 3½ months and one after about 5 months, having taken approximately 1½ to 3 grams of carbonate of lead. The lesions were very similar in all four animals.

Macroscopically the kidneys were a little pale and opaque, otherwise unaltered. Sections of pieces hardened in Flemming's solution show comparatively slight changes in the epithelium of the convoluted tubules and the ascending loops of Henle. Some of the cells show granular degeneration and also slight fatty changes. There are a few cells with pyknosis of the nuclei. Some of the epithelial cells have become detached and have dropped into the lumen of the uriniferous tubules. In some of the specimens one finds collections of such cells in the large ducts in the pyramids, the epithelial covering of which is unaltered. An active regenerative process in the epithelium is indicated by the occasional occurrence of nuclear figures. In all sections there are small areas of cellular infiltration around the blood vessels at the hilum of the glomeruli. These cells are mostly large cells of epithelioid type with large vesicular nuclei. Occasionally mitoses can be seen in the nuclei of these cells. One also finds a few lymphocytes and cells resembling plasma-cells. Similar cells have accumulated in moderate number along the course of the vascular loops of the glomeruli near the hilum. The larger blood vessels are normal. In some places these collections of cells crowd on the adjoining tubules which then show more or less atrophy, but no more nor less degenerative changes in the epithelium than in other parts (Fig. 1.). The most important other organs were examined microscopically, but no lesions were present.

EXPERIMENTS ON DOGS.

EXPERIMENT 1.—Cocker, female, received every fourth or fifth day, starting from Oct. 18, 1904, a certain quantity of 1/1,000 solution of lead acetate with the drinking water. During October, November and December the dose was 5 c.cm.; in January, 1905, 10 c.cm.; in February and part of March, 20 c.cm.; the rest of March, 30 and 40 c.cm.; in April and May, 55 c.cm.; in June, at first 100, later 150 c.cm.; in July, 150; in August, September and October, 100; in November and December and January, 1906, again 50 c.cm. Dog died Jan. 5, 1906. This dog received in all, 8.65 gm. of acetate of lead in the course of fifteen months. The urine was examined at least once a week with the ordinary clinical tests, and remained normal all the time. The blood showed the usual progressive anemia.

Autopsy.—At autopsy the kidneys were found hard and somewhat cyanotic. In the cortex there were a considerable number of small but plainly visible retracted scars, mostly at the poles. There was no deposit in the pyramids. Joints were normal. In lower part of abdominal aorta a slight irregular fibrous thickening was present in the intima which on microscopic examination did not show any cellular infiltration or any degenerative changes. It apparently was an old accidental non-progressive lesion. So far as one can judge there was no marked enlargement of the heart,[43] the right ventricle was perhaps slightly dilated, but although the liver was cyanotic there was no evidence of cyanotic atrophy.

Microscopic Examination.—The following microscopic changes were found in the kidneys.

Epithelium: The functionating epithelium in the convoluted tubules and in the ascending loops of Henle showed rather diffusely various stages of degeneration (granular and fatty change of a mild degree). Some of the nuclei were pyknotic, other cells did not show any nuclear staining. A certain number of epithelial cells had become detached and had dropped into the lumen. Such desquamated cells were also found in the large ducts in the pyramids which were otherwise normal. Most epithelial cells contained much brown granular pigment.

Practically all glomeruli were diseased and very similarly affected. There was a slight swelling and partial desquamation of the capsular epithelium. The capsules contained a little granular material, and a few red blood corpuscles in places. The vas afferens and the parts of the capillaries near it showed a marked thickening of the wall without much obstruction of the lumen. The thickening was partly due to an increase in the number of cells composing the wall, the new cells being rather large with vesicular nuclei, partly to the presence on the outside of the normal capillary wall of an apparently hyaline substance which stains brown with the van Gieson method. In some places the new formation in this hyaline substance of very delicate connective tissue fibrillæ which stain purple with the van Gieson method was evident. The process represented evidently a mild degree of chronic glomerulo nephritis (Fig. 4).

The interstitial tissue in every section showed several large more or less cone-shaped areas of fibrous thickening, with considerable cellular infiltration in places. These areas were situated along the course of the blood vessels, irregularly scattered in the cortex, but most numerous in the outer portion, and also near the dividing line between cortex and medulla. The tubules in these areas show a marked atrophy. Few of the atrophic tubules and also a few others contained hyaline casts, which, however, were scarce (Fig. 3).

EXPERIMENT 2.—Old pug dog, male, started from Oct. 19, 1904, receiving 1/1,000 lead acetate solution with his drinking water every fourth or fifth day very much in the same way as dog in Experiment 1. He took in all 8.42 gm. of lead acetate in fifteen months. The urine was examined at least once a week with the ordinary clinical tests and did not show anything abnormal at any time except on December 19, when, after a severe exertion (a fight with another dog), it contained much albumin and many hyaline and granular casts. The blood showed the usual progressive anemia. The animal died Jan. 19, 1906.

Autopsy.—At autopsy the kidneys were a little hard, cyanotic, but otherwise of normal appearance. No deposits in the pyramids. Aorta and joints were normal. The heart seemed to show a moderate dilatation on both sides. The liver showed a marked passive congestion, but microscopically there was no evidence of cyanotic atrophy. Microscopic examination of the kidneys revealed the same lesions as in dog in Experiment 1, except that the areas of chronic interstitial nephritis, although just as numerous, were not quite so large.

EXPERIMENT 3.—Small bitch. Experiment started Oct. 25, 1905. Mode of administration was the same as in Experiments 1 and 2. The dog took in all 7.28 gm. of acetate of lead in the course of twelve months. The urine was examined as usual and found normal at all times. She was examined Oct. 26, 1905.

Autopsy.—At autopsy the kidneys were hard, the surface smooth, the markings not so distinct as normally, and the cortex a little opaque, especially near the medulla. There were no deposits in the pyramids. Joints and aorta were normal. The heart seemed to show a moderate dilatation on both sides. There was no cyanotic atrophy of the liver. The beginning of the aorta showed a diffuse fibrous thickening of the wall to about twice the normal diameter. There was similar but not so marked thickening of the arteries of the neck. (Microscopically there was much dense hyaline fibrous tissue in adventitia and along the vasa vasorum. There was no cellular infiltration.) There was some dead degenerated fetus *in utero*. The microscopic lesions in the kidney were very much like those in dogs in Experiments 1 and 2. The areas of chronic interstitial nephritis were somewhat smaller, more cellular, situated almost exclusively at the dividing line between cortex and medulla. Some of them reached a distance into the medulla. The thickening of the walls of the vascular loops of the glomeruli near the hilum was entirely cellular (Fig. 4).

43. It is very difficult to form an opinion as to what size the heart should be in a given dog as its size is evidently not directly proportionate to the size and weight of the dog and as we have no other standards to compare it with, such as the fist in man.

EXPERIMENT 4.—Experiment started Jan. 30, 1906. Mode of administration was the same as in the other dogs. This dog took in all only 0.85 gm. of acetate of lead in one and one-half months. He was killed by another dog March 4, 1906. The urine was examined as usual and found normal.

Autopsy.—At autopsy no macroscopic lesions were found in the kidneys. Sections showed granular and beginning fatty change in some of the epithelial cells in the convoluted tubules and the ascending loops of Henle, beginning desquamation of the epithelium in a few places. In serial sections a few small areas of cellular infiltration around the blood vessels near glomeruli were found. The cells were partly lymphocytes, partly larger cells with vesicular nuclei. They began to crowd the adjoining tubules and extend into the glomeruli along their stalks.

The kidneys of all dogs that were treated a sufficient length of time showed a marked chronic interstitial nephritis. In the dog in Experiment 1 the change was plainly visible to the naked eye. Although the condition is not entirely that of an extreme granular atrophy, the lesions are cerainly definite enough to make sure of the nature of the process. It is interesting to note that, in spite of careful repeated examination neither albumin nor casts were ever found in the urine of these dogs. It is true the urine was not directly obtained from the animals, but collected in metabolism-cages. It is possible, therefore, that a few casts might have escaped observation and I am fairly certain that, under more favorable conditions, renal epithelium could have been detected in the sediment. Albumin in appreciable quantity was certainly absent, as it was also in the experiments of Charcot and others. This observation gives support to the clinical suspicion that in man also such lesions may develop with very little, if any, change in the urine. It also corresponds with our clinical experience that in dog in Experiment 2 a severe exertion was followed by the appearance of albumin and casts in the urine.

The experiments on the guinea pigs and on dog 4 reveal the initial stages of the process. The lead produces a certain amount of degeneration, some necrosis and desquamation in the epithelial cells of the convoluted tubules and ascending loops of Henle. One also observes evidence of a probably regenerative proliferation in them. Casts were present, but not very numerous.

The cellular infiltration commences around the blood vessels near the glomeruli. Part of the cells which collect in the tissues are lymphocytes, the larger part, however, probably proliferated connective tissue cells. That at least some of them are formed *in situ* is shown by the occurrence of mitoses. Considering the chronicity of the process, one would naturally not expect to see many karyokineses, even though most of the cells were the results of proliferation of the fixed cells of the tissue. On account of their scarcity, the mitoses have not been mentioned by all observers (Burmeister,[23] for instance, claims that none were present in his sections). In the end the formation of quite a little new fibrous tissue may be the result of this proliferation of the connective tissue cells.

Similar cells make their appearance along the vascular loops of the glomeruli at their point of attachment to the adjoining tissue and ultimately lead to the development of a chronic glomerulo-nephritis.

Most observers noting the early degenerative changes in the epithelium and the much later occurrence of the lesions in the interstitial tissue have followed Weigert's lead in contending that the epithelial changes are primary and those in the connective tissue secondary in character. I confess I can not see the force of the argument. If any irritant acts simultaneously on both the epithelium and the connective tissue, this must necessarily happen. The epithelial changes are early because the degeneration can and does occur within a short time, whereas the more slowly developing changes in the connective tissue show much later, necessarily. Moreover, as has been pointed out by former observers (Germont,[16] Stieglitz,[31] Paviot[34] and others), there is no direct topical relation between the degenerative changes in the epithelium and the proliferative changes in the connective tissue. The epithelial degeneration is more or less diffuse, the connective tissue changes localized and the tubules at the point of the lesion in the connective tissue do not show a particularly severe degree of degeneration. Moreover, it is plainly brought out by all experimental evidence on this question that the more chronic the process the less marked the lesions in the epithelium and the more pronounced the interstitial changes. If the interstitial changes depended directly on the epithelial destruction such could not be the case. The probability, then, would be that large doses would be followed by very severe epithelial lesions with rapid fatal termination, medium repeated doses would cause still severe but not immediately fatal epithelial lesions followed by interstitial lesions and small repeated doses would give very slight epithelial lesions not sufficiently serious to give rise to secondary changes in the interstitial tissue. This is not borne out by experiments with any of the substances which so far have been investigated. I believe, therefore, that, on the contrary, the experimental evidence furnishes almost positive proof that the changes in the epithelium and in the connective tissue are coordinate, not subordinate, to one another. They are the effect of the same cause acting simultaneously on different tissues, with different vulnerability and different reaction time, so far as visible changes are concerned.

On account of the difficulties encountered in keeping the animals alive for the necessary length of time and also in order to supplement the experiments made with lead, two dogs were given small doses of bichromate of potash in milk. Both were treated exactly in the same manner. One of the dogs was unfortunately lost in the confusion following the earthquake in San Francisco. In the other one, which was examined some time before, the following condition was found at autopsy:

Experiment with Bichromate of Potash with Milk.—Experiment started Nov. 10, 1905. The dog was given 1/50 aqueous solution of bichromate of potash in milk every fourth or fifth day. The initial dose was 5 c.cm., which was laterly slowly increased to 20 c.cm. He took in all nearly 11 gm. of bichromate of potash in four and one-half months. On March 22, 1906, the dog was chloroformed and examined. During the course of the experiment some anemia developed with a few normoblasts in the peripheral circulation, and very many in the bone-marrow, but the anemia was very mild compared with that observed in the animals taking lead. No megaloblasts were found. The urine was examined once a week with the ordinary clinical methods. No albumin or casts were demonstrated except perhaps a trace of albumin on January 24, and again on February 28. In a fresh sample of urine obtained directly from the dog on February 14, a few cells resembling renal epithelium were found in the sediment. The dog vomited repeatedly after having taken the bichromate and at autopsy considerable gastritis and a marked follicular enteritis were noted, especially in the duodenum and upper part of the small intestine. There were, however, no ulcers nor even any epithelial defects to be found microscopically in sections. The heart was rather large. The surface of both kidneys was slightly irregular and numerous badly defined hard grayish white areas could be discerned in the cortex. Sections of specimens hardened in Flemming's solution showed the following lesions: These were granular

and beginning fatty degeneration of many epithelial cells in the functionating tubules. Some of the cells were necrotic, but still *in situ*, others had become detached. No mitoses were found in the epithelial cells. There were no casts. Many glomeruli showed a marked thickening of the tunica propria of the capsule. The capsular spaces of many of them were dilated and filled with coagulated fluid, sometimes containing a few red blood corpuscles.

Throughout the cortex there were a large number of areas of cellular infiltration of considerable size. The larger ones showed considerable new formation of young fibrous tissue in the center. These areas were always perivascular, usually near glomeruli. In many places cells similar to those found in these areas were also present alongside the vascular loops of the glomeruli near the hilum. The cells were partly lymphocytes, frequently, however, larger cells with large vesicular nuclei which were often more or less distorted. Nuclear figures could be found in some of these cells. In all foci a few very large cells with large protoplasmic bodies filled with coarsely granular materials were encountered, the granules staining dark brown or almost black with osmic acid. The larger arteries were surrounded by thick masses of old hyaline fibrous tissue, but there was no endarteritis (Fig. 5).

Sections of the liver showed much fat in the liver cells and also some in many endothelial cells of the capillaries. In a few places there was a slight cellular infiltration of the periportal connective tissue.

The experiment shows that, in spite of the fact that this dog took the poison for 4½ months only, the lesions in the kidneys were more marked than those in the lead dogs that had been under observation for a year and longer. The bichromate of potash, therefore, seems to promise for future experimentation along these lines. Although the lesions were so much more severe, the urine in these dogs nevertheless did not contain at any time any appreciable amount of albumin. Only once cells were discovered in the sediment which looked like renal epithelium.

The experiments will be continued in the hope of obtaining still more marked lesions of the kidneys, of producing more definite disturbances in circulation with consecutive hypertrophy of the heart, and of obtaining some information about the relation of renal and vascular disease in chronic nephritis. In none of the experiments so far has any definite arteriosclerosis been present in the affected kidneys or in any other part of the vascular system except some evidently old accidental lesions.

I believe these objects can be accomplished by still more cautious administration of the poison and by continuing the experiments still longer than has been done heretofore.

Publication of my observations at this early stage may seem to need some justification. I hope, however, that it may contribute to dispel erroneous conceptions in regard to the value of this work, especially in reference to human pathology and to encourage others, with perhaps better facilities at their disposal, to undertake investigations along the same lines.

ADDITIONAL NOTE.

Since the foregoing was written guinea-pig No. 5 died on Sept. 7, 1906. It had received the same treatment as guinea-pig No. 4. It had not taken any more lead since May 10, 1906, except a few small doses in August. Postmortem examination showed in both kidneys very many just visible retracted scars in the cortex underneath the capsule. They were placed about equal distances from another. There were no adhesions between cortex and capsule.

On microscopic investigation they proved to be areas of new formed fibrous tissue with considerable cellular infiltration. Most of the tubules in these areas show a marked atrophy. There is little fat in the epithelium of the atrophic tubules. The epithelium in all other tubules does not show any lesions either in ordinary specimens nor in those prepared with the Flemming mixture (Fig. 2).

In concluding, I wish to acknowledge my indebtedness to the Rockefeller Institute for Medical Research for a grant of money which has enabled me to do the experimental work reported on in this paper.

RHEUMATISM OF CHILDHOOD.*

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In the early days of medicine, every disease was attributed to the flow of an acrid and poisonous humor to the part affected. This crude pathology has a partial survival in our modern terms, rheumatism and catarrh, both of which have their origin in the Greek ῥέω to flow.

It is interesting to note that almost all that is indefinite and vague of disease to-day is embraced by one or the other of these terms.

It has been comparatively recent since certain phenomena appearing in childhood came to be regarded as manifestations of rheumatism. Before this, rheumatism was not believed to affect young children. Once admitted, however, to the diseases of childhood, rheumatism comes now like all diseases newly recognized and taught to be the too quick diagnosis.

I do not agree with the statement in certain text-books to the effect that rheumatism in young children is more likely to be overlooked than to be confused with other conditions. In an endeavor to teach a broader conception the tendency has been, and still is, to multiply the number of diseased conditions having relationship with rheumatism and to base the diagnosis of the latter on any of these so-called manifestations, provided they have past, present or future association with real or imaginary pain.

Cheadle, whom many of our text-books follow, saw in every child a probable case of disease. He asserted that it was one of the commonest diseases in the wards of a children's hospital with which he was connected. Whatever influence atmospheric condition may have in producing rheumatism, it is not unfair to assume that a considerable number of these London cases were due to "fog."

Granting that we are indebted to the English authors for giving us a broader conception of the disease as it appears in childhood, isn't it possible that this conception has even been stretched? In connection with the rheumatism of adults, the protest that there is too "much of a muchness" may now easily be hushed, since a number of writers are clearing up much of the confusion by intelligent and satisfactory classifications of both acute and chronic joint affections. As these studies progress, the trend is to limit the term "rheumatism" to certain cases of acute polyarthritis having symptoms more or less definite and constant. In the terminology of disease, chronic rheumatism is finding fewer and fewer applications. Many disorders once obscured under the latter name are being separated and placed under new or readjusted headings. This work, no matter how commendable, has for the most part left

* Read in the Section on Diseases of Children of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

the child-types out of its consideration. Certainly it would be an equally welcomed accomplishment to determine just how many of so-called multi-manifestations of rheumatism have a positive connection with the disease. For a number of good reasons, no one is fully ready for a demonstration of this kind.

Disclaiming at once any attempt to leave the impression that this paper will settle any of these questions definitely, I still hope that the subject as presented will provoke discussion sufficient to bring about elucidation of at least some of the points to be raised.

ETIOLOGY.

In the study of acute rheumatism, one of the most discouraging things is the number of theories that have from time to time been advanced in explanation of its origin. It will not be necessary or profitable to discuss all of these theories. No matter how plausible some of them at one time seemed, the plausibility of any particular theory came rather from the confusion existing as to the nature of rheumatism than from the fact that the theory satisfied the etiology of the disease as we understand it to-day. From accumulating clinical observations the evidence points very strongly to the infectious origin of the disease. Pertaining to this infection, however, there are, broadly speaking, three views:

1. In England, Poynton, Paine and others feel confident that they have settled the whole question as to the infection. They have isolated from the joints, blood, and, after death, from the valves of cases regarded by them as acute articular rheumatism, certain cocci growing in pairs or chains, which, when injected into rabbits and monkeys, produced arthritis, and sometimes endocarditis, and twitching movements resembling chorea. Since these organisms are capable of producing the above results, the workers regard them as the special and the only bacteria concerned in causing rheumatism. For this class of bacteria they have created the special name *Diplococcus rheumaticus.*

2. The majority of bacteriologists and clinicians in this country, where the work of the English observers is not generally considered conclusive, do not believe that the special cause of rheumatism is yet known. The cocci isolated by the English workers are here looked on as secondary invaders in a disease, the infection of which, though probably specific, has not yet been discovered. The importance of streptococci in producing certain articular and endocardial lesions is well known, but these streptococcal lesions have not been proven to be of a truly rheumatic nature.

3. In addition there are many careful and observing men who regard the infection in rheumatism as something engrafted. They believe that autotoxic agents are primarily concerned. These toxins formed in the alimentary canal as the result of disordered digestive functions, produce disturbances in metabolism and alteration in the tissues. The body suffering these effects of autointoxication has its vital resistance lowered and is therefore subject to microbic invasion. The infection is not considered the same in every instance by these writers, and though occurring in many cases, it is regarded as accidental rather than incidental.

Whatever is ultimately proven right as to the infection, there are certain predisposing and determining factors worthy of consideration. Exposure to cold is generally admitted to act as an exciting cause. Chilling the surface of the body contracts the superficial vessels and thereby produces a congestion of the internal organs. Thus it interferes with the elaboration of the internal secretions of the organs, and, as Shoemaker[1] suggests, of the muscles as well. These results are intensified if the body has been previously overheated. The conditions resulting may be considered as favorable for the entrance of infection as for the development of autotoxemia.

Heredity is persistently, and no doubt correctly, given as a predisposing cause. It is well to remember, however, that self, and too often professional, diagnosis, is entirely untrustworthy in establishing a family history of rheumatism. Almost any obscure or obstinate pain is likely to be classed under that term.

Of equal importance with heredity is environment. The disease is more frequent in localities marked by sharp changes in temperature. High and low altitudes show some exemption.

Malhygiene as to clothing, housing and food predisposes to rheumatism. One attack of the disease almost invariably means another and recurrent attacks.

MANIFESTATIONS IN YOUNG CHILDREN.

Eliminating scurvy, pyemic arthritis and the soreness and stiffness of joints and muscles caused by cruel clothing, coddlings and bouncings, the cases of rheumatism occurring in nurslings are reduced almost to nil. From the eighth year onward an attack of rheumatism in a child resembles more or less closely the adult type. We now find the moderate or high fever, the sweats, the migratory arthritis, and in fact almost all that goes to make up our idea of the disease. It is more especially to cover the period between early infancy and the eighth or tenth year that a number of phenomena in combination and sometimes even in isolation, have been brought forward as manifestations of rheumatism.

Of the conditions to be regarded at times as manifestations of rheumatism in the young, the following is a partial list compiled from various modern writings: "Growing pains," "wandering pains," gastric pains and pleuritic pains, torticollis, tonsillitis, chorea, tics, nosebleed; subcutaneous fibroid nodules; erythemas, especially nodosum; cardiopathies, including endocarditis, myocarditis and pericarditis; nephritis, asthma, bronchitis, pleurisy, pneumonia, Graves' disease, meningitis, conjunctivitis, keratitis, iritis, eczema, tetany, chilblains, herpes, urticaria, purpura, psoriasis, acid dyspepsia.

Though not including all the conditions, which in one combination or another have been regarded as manifesting the disease, this list is probably complete enough to show that the coveted broadened conception of rheumatism prevails.

ENDOCARDITIS.

Some few of the above conditions occur so frequently associated with rheumatism that the connection can not easily be denied. The most important of these are the cardiopathies, particularly endocarditis.

Now that the connection has been fully established it seems high time that a little more stress were put on the possibilities of error resulting from a too close association of our ideas of endocarditis with rheumatism. There are a number of infective processes, such as the influenzal, tuberculous, gonorrheal, typhoidal, streptococcal, etc., widely different in nature from rheumatism and capable of producing arthritis and endocarditis.

In childhood the distinction between any one of these

1. N. Y. Med. Jour., Feb. 24, 1906.

processes and rheumatism is, at best, not always easy. With any preconceived idea that the associated conditions of arthritis and endocarditis invariably point to rheumatism, mistakes will be common.

CHOREA.

The relationship between chorea and rheumatism has been by many writers considered a close one. Poynton and Paine[2] have again raised the discussion on this question.

They believe that, while all chorea is not necessarily rheumatic, the great majority of cases are to be regarded in that light. They believe, moreover, that they have been able to prove the connection by showing that the special micro-organism of rheumatism, so regarded by them, can be isolated from choreic cases. If we are convinced that *Diplococcus rheumaticus* is the specific bacterium of rheumatism we are in a much better position to accept the conclusions of these writers in their studies of chorea. They admit, however, that the specific organism may not be found except in suitable cases of rheumatism. They say:

> Suitable cases are limited to acute and severe ones in which the lining membrane of the serous cavities are greatly damaged, or in which the type is malignant. Sero-fibrinous pericarditis and malignant endocarditis are excellent examples.

No matter how much we would like to agree with these writers, in order to simplify the many problems of rheumatism, it seems to me that we must admit that Cole's[3] point is a good one, which raises the question of a terminal or secondary infection in these cases on which Poynton and Paine based their studies in seeking the special cause of rheumatism. Lacking a number of points in the proof that *Diplococcus rheumaticus* is the special bacterium of the disease, these men have apparently only been working in a circle in their efforts to show the rheumatic connection of the several conditions in which they were able to find it. The fatal cases of chorea discussed in their paper were very probably mixed infections. The case of meningitis reported in the same paper was almost certainly one of convalescent rheumatism infected with pneumococci.

Bacteriologically, then, the connection between chorea and rheumatism has not been proven. Clinically, the evidence is far from convincing. The majority of English and French writers maintain that the relation is a close one. But even here opinion is by no means unanimous. "Gilles de la Tourette, Charcot, and others, after many observations, were convinced that this relation did not exist." The German authors, as a rule, hold out against the view that chorea and rheumatism are related. Spiller,[4] among other neurologists in this country, thinks the connection has been much exaggerated. In most of his own cases of chorea he was unable to establish any rheumatic history.

There are, too, certain differences in the behavior of chorea and rheumatism, which, taking the view that the conditions are in any sense closely related, will be hard to explain. While rheumatism is of common occurence among negroes, chorea is rarely seen in that race. In certain localities where rheumatism is endemic, chorea is not proportionately increased, and in fact may be met with but seldom. In other localities, like some parts of Texas, rheumatism is almost unknown, though chorea is by no means infrequent. Before puberty chorea occurs more frequently in females. The same is true of rheumatism, if we regard the so-called manifestations at this period as not too shadowy for diagnostic purposes. At and after puberty the number of cases of chorea occurring in females, as compared with cases ocurring in males, is even more decidedly increased. But at about this period of life, when the symptoms of rheumatism are more clearly marked than in childhood, rheumatism is more frequent in males.

These facts, coupled with our knowledge that not an inconsiderable number of cases of chorea occur during pregnancy; that an attack may follow emotional strain or fright; that accredited reports of cases following some one of the exanthemata are not infrequent; that chorea sometimes develops immediately after slight injury or surgical operation, would all seem against the opinion that there is any close connection with rheumatism.

TONSILLITIS.

That acute rheumatism is often preceded or accompanied by an attack of tonsillitis is an observation made by many writers. The relation, however, between the condition of the tonsils and the development of the rheumatic attack can not be fully determined until the bacteriology of the latter has been more fully worked out. Till this is done it will be well to keep in mind the possibility of a mistaken diagnosis in these cases of arthritis following tonsillar inflammation and disease. Almost every day some new evidence is brought forth emphasizing the importance of the tonsils as an inlet of infections which result in a number of pathologic conditions. We know that it is not an uncommon thing for a patient with tonsillitis to have aching limbs and pains about the joints. In the adult these aches and pains are rarely so marked as to be regarded in the light of rheumatism. On no better evidence, however, the young child, in which little is required to direct our minds rheumatic-wise, may be subjected to salicylic drugging.

The predominating bacterium in tonsillitis is almost always the streptococcus. Cole has proven experimentally that streptococci, when injected into animals, produce arthritis and endocarditis. Packard[5] and others have reported a number of cases of endocarditis following tonsillitis. In these cases there was no evidence of rheumatism. Morse[6] reported four cases of nephritis, two of them in children, due to tonsillitis. To none of these latter cases was there any history of rheumatism attached. Moreover, Morse found these cases after a brief observation, and concluded, with every reason for being right, that such cases are more common than is known.

Keeping in mind the experiments of Cole, the chief organism concerned in tonsillitis and the fact that in man arthritis, endocarditis or nephritis may occur either singly or combined, following tonsillar infection, we are ready, I think, to see how an apparently mild case of tonsillitis may be followed by a general, though perhaps moderate, streptococcus infection. But unless we believe that there is no such specific disease entity as acute rheumatism, and that all cases classed under that name are no more or less than streptococcus infections, it seems to me we must admit that a considerable number of these cases of arthritis, with their complications developing in the wake of tonsillitis, are as far from being

2. "Nervous Manifestations of Rheumatism," The Lancet, Dec. 16, 1905.
3. N. Y. Med. Jour., March 17, 1906.
4. "Symptomatology, Pathology and Treatment of Choreiform Movements," THE JOURNAL A. M. A., Feb. 11, 1905.
5. Paper read at Assoc. American Physicians, 1899.
6. Archives Pediatrics, May, 1904.

rheumatic in nature as are the cases of acute pyemic arthritis of infants.

What makes confusion still easier is the fact that tonsillar infection, with its resulting complications, is, like rheumatism, very likely to recur.

ERYTHEMA NODOSUM.

The rheumatic connection of erythema nodosum believed in by many of the older writers, and more recently by Cheadle, is not confirmed, according to some of the present-day writers, by closer clinical observations. In the absence of opportunity to make anything like wide observations in this disease I ought probably to withhold an opinion. But that discussion by those of you, who have had a larger experience with erythema nodosum, may be brought out, I want to suggest that this disease, too, is only another of the variable streptococcus infections of which the tonsils are the usual port of entry.

Two years ago Abt[7] reported three cases of erythema nodosum to this section. In none of these cases could a history of rheumatism be established. What was especially interesting to note, however, was the fact that the one case which Abt had opportunity to observe from the very onset of the present illness, was treated by him ten days before in an attack of membranous tonsillitis. Bacteriologic examination proved the latter condition to be a streptococcus infection.

The findings in a single case of any disease may prove but little. At the same time, in a condition like erythema nodosum, the nature of which is the subject of discussion and the absolute knowledge of which is meager, close observations may suggest along what lines profitable work may be done, and may, at least, be taken as so much evidence *pro* or *con* prevailing opinion.

Finger, moreover, has already found streptococci in the inflamed tissues of erythema nodosum, and the same author, after a number of observations, concluded that the disease was a septic process. A few more studies like Finger's and Abt's will almost positively separate the disease from the rheumatic class and may prove it to be no more or less than streptococcus infection usually following tonsillitis.

As to the many other conditions considered among the manifestations of child rheumatism I have at this time very little to say, except to express the opinion that one by one they will be taken away from this connection until rheumatism will come to mean not everything, but something, or nothing.

THE CLINICAL ASPECTS OF RHEUMATIC FEVER IN CHILDHOOD,

AND THEIR SIGNIFICANCE IN THE QUESTION OF SPECIFIC ETIOLOGY.*

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Knowledge of the disease, which is here termed rheumatic fever, for reasons to be set forth in the course of this paper, has been recently much advanced by certain experimental work and the criticisms on it. The advance, both from the incompleteness of the evidence and the difficulty of judging as to its final value, is somewhat fraught with confusion. The lack of definite knowledge of the etiology of the disease was one of the motives for this paper. A second motive was the failure of many standard text-books fully to appreciate the marked peculiarities of this disease in early life as distinguished from adult life.

The clinical study of a number of cases was undertaken, in the hope that it might bring forward certain peculiarities of the disease in childhood, and that these peculiarities might throw some light on the question of etiology, or might at least form a basis for further study.

NOMENCLATURE.

The word rheumatism has been so much abused that some authorities advocate discarding it altogether. It has been applied to almost every condition associated with pain in the joints, muscles, fibrous tissues, and nerves of the body. In proportion to the progress of knowledge of these conditions, the terms rheumatism and rheumatic have been applied to a constantly decreasing number of conditions. Special progress has been made in the detailed study of joint pathology, with the result that many conditions, particularly of a chronic character, which were formerly included under the term rheumatism, have been relegated to their proper place in classification. Finally, this term, from the point of view of those engaged in classifying joint diseases as such, came to be limited to those conditions of arthritis which were supposedly due to infectious processes. Further objection to the use of the term rheumatism could still be made, on the ground that the condition of arthritis has been shown to occur in a variety of infections, such as scarlet fever, gonorrhea, septicemia, etc., and that for this reason the word rheumatic loses its significance. Consequently, it seemed to many authorities far preferable to discard the term rheumatic as applied to infectious joint conditions, and to substitute the term infectious arthritis as covering the entire group.

The use of this term, infectious arthritis, has its origin in the study and classification of the joint diseases as such, and it would be improper to use it to describe a disease which is not a disease of the joints as such. If there is a disease of which arthritis is only one of several co-ordinate manifestations, and if this disease has a specific etiology, we should use some other name in speaking of that disease. Again, if there is a disease of which arthritis is only one manifestation, and if this disease has a fairly constant and definite anatomic and clinical description which can be distinguished from the description of other forms of infectious arthritis, and in which the definiteness of the description suggests the probability of a specific cause, or at least of a specific reaction of the body, we should use some special term in describing that disease. The use of such a special descriptive term is only following precedent, for we classify diphtheria as a specific disease from its specific etiology, and scarlet fever as a specific disease from its definite clinical picture. Provided that rheumatic fever is such a disease as we have described, we have no more right to use the term infectious arthritis as synonymous with rheumatic fever than we have to use the term infectious angina as synonymous with scarlet fever.

The term rheumatic fever has been chosen to describe such a disease—if its exists—as being preferable to the term acute rheumatism, for the reason that it is analogous to the terms typhoid fever and scarlet fever, which have stood the test of time. The name acute articular

7. "Erythema Nodosum," THE JOURNAL A. M. A., Nov. 12, 1904.

* Read in the Section on Diseases of Children of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

rheumatism is obviously a bad one, if the disease is neither primarily nor constantly articular.

It is necessary to determine, if there is a disease of specific anatomic and clinical description, to which the name rheumatic fever can properly be applied.

ETIOLOGY.

In most of the studies of the etiology, rheumatic fever was defined as a disease characterized by fever, polyarthritis, and a tendency to complications in the heart and serous membranes. Many views as to the etiology of these conditions have been successively advanced and discarded. That one of them all which has survived to the present day is the view that rheumatic fever is a manifestation of infection.

Mantle,[1] in 1887, advanced views of its infectious nature. Popoff,[2] in 1887, whose experiments attracted very little attention, cultivated a micrococcus from a rheumatic fever patient, and produced in rabbits by intravenous inoculation arthritis, pericarditis and endocarditis. Achalme,[3] in 1891, found a bacillus resembling anthrax in nine cases of rheumatic fever. He failed to reproduce the disease in animals. Sahli,[4] in 1892, obtained several varieties of bacteria from the blood, urine and joint fluids of rheumatic fever patients, but could scarcely ever produce arthritis in animals. Singer,[5] in 1898, obtained the same results. Goldscheider,[6] in 1892, reported a case of serous pleurisy complicating a case of polyarthritis, in which a streptococcus was found, not pathogenic for animals. Dana,[7] in 1894, obtained a diplococcus from a case of chorea following rheumatism. Widal and Bezancon,[8] in 1894, found a streptococcus in the mouth of a rheumatic fever patient, which caused endocarditis in rabbits. They failed to produce endocarditis in five experiments with other streptococci. Thiroloix,[9] in 1897, isolated a bacillus, apparently identical with Achalme's, from a rheumatic fever patient, and claimed by intravenous injection in animals to have produced the entire picture of rheumatic fever. Triboulet,[10] in 1898, found a diplococcus in five cases of rheumatic fever. In two of these cases it was associated with Achalme's bacillus. Triboulet and Apert,[11] in 1898, isolated a diplococcus from eleven cases of rheumatic fever, which produced an endocarditis in a rabbit, but which failed to produce arthritis. Westphal and Wassermann,[12] in 1899, isolated a diplococcus from a case of severe rheumatism and chorea, which produced regularly polyarthritis in a series of eight rabbits, and was recovered from the blood and heart valves. Meyer,[13] in 1901, investigated the bacteriology of the tonsils in rheumatic fever. There were many negative cases. In five cases he found streptococci. He investigated as a control many cases of sore throat without rheumatism, and could always find streptococci, but these streptococci always produced in guinea-pigs subcutaneous abscesses, whereas the streptococci from the rheumatic patients never caused suppuration, but caused polyarthritis resembling the rheumatic, and occasionally pericarditis, non-purulent peritonitis and pleurisy. In one-fifth of the animals there was a valvulitis, and he succeeded in recovering the organism from the heart valves. Menzer,[14] in 1902, confirmed Meyer's work.

The most important contributions to the study of the etiology of rheumatic fever have been made by English investigators. Poynton and Paine,[15] in 1900, isolated a diplococcus from eighteen cases of rheumatic fever, in five cases in pure culture. This organism was obtained from the blood, joints and heart valves. Inoculated in large doses intravenously into rabbits, it produced all the clinical and anatomic characteristics of rheumatic fever, polyarthritis, valvulitis, pericarditis, and one rabbit developed a condition suggesting chorea. The organism could be recovered from the exudates, blood, urine and cerebrospinal fluid. Beaton and Ainley Walker,[16] in 1903, confirmed these results and made a detailed study of the organism. Poynton and Paine[17] repeated their experiments in 1903, with the same results, isolating a diplococcus from twenty-two cases of rheumatic fever, sometimes from blood cultures during life. In rabbits, arthritis was almost constant, while pericarditis, endocarditis and pleurisy occurred. Pus was never produced. Ainley Walker,[18] in 1903, obtained similar results. Beattie,[19] in 1904, obtained an organism from the inflamed patches on the synovial membrane of a rheumatic fever patient, and with it, in rabbits, produced typical polyarthritis, endocarditis, and also chorea, with twitching of the head and eyes. In the same year he published a detailed study of the morphologic and cultural characteristics of the micrococcus, which failed to show a means of distinguishing it from other streptococci. Lewis and Longcope,[20] in this country, in 1904, isolated a streptococcus before death from a case of chorea, endocarditis and rheumatism. This organism produced constantly in rabbits a multiple arthritis, which was neither purulent nor fatal. They once obtained endocarditis. Culturally, the organism resembled the *Streptococcus pyogenes.*

As a result of all these researches, among those believing that rheumatic fever is an infectious process, two views are held at present as to its etiology.

1. The bacteriologic view, that the disease is a specific infection, due to a specific micro-organism.

2. The clinical view, that the disease is not due to a specific infection, but that it is a particular reaction of the body to a wide variety of organisms.

Under the bacteriologic view, two varieties of micro-organism present claims to be considered the specific cause, a micrococcus, called by the English investigators *Micrococcus rheumaticus,* and a large anaërobic bacillus, usually called Achalme's bacillus. The claim of the latter is lacking in proper confirmation, and it has finally

1. Mantle: Brit. Med. Jour., 1887, vol. i, p. 237.
2. Popoff: Medit Prebavlena K. Morskowa Sboneskle, 1887, p. 401.
3. Achalme: Compt. Rend. Soc. de Biologie, Paris, 1891.
4. Sahli: Deut. Arch. f. klin. Med., 1892, vol. ii, p. 451.
5. Singer: Aetiologie un Klinik des Akuten Gelenkrheumatismus. Leipsig, 1898; Verhandl. dis. xix, Cong. f. innere Med., 1901, p. 441; Wien. klin. Wochschr., 1901, No. xx.
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12. Westphal and Wassermann: Berl. klin. Wochft., 1899, p. 29.
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14. Menzer: Aetiologie des akuten Gelenkrheumatismus, Berlin, 1902.
15. Poynton and Paine: Lancet, Sept. 22 and 29, 1900, pp. 860 and 932.
16. Beaton and Walker: Brit. Med. Jour., vol. i, p. 237, vol. ii, p. 659.
17. Poynton and Paine: Brit. Med. Jour., vol. ii, p. 779; Med. Press and Circular, vol. cxxvi, p. 478.
18. Ainley Walker: Practitioner, 1903, vol. lxx, p. 185.
19. Beattie: Jour. of Path. and Bact., vol. ix, p. 272; Brit. Med. Jour., Dec. 3, 1904.
20. Lewis and Longcope: Am. Jour. Med. Sci., 1904, vol. cxxviii, p. 601.

been shown to be a saprophyte. The weight of evidence points toward a micrococcus as being the organism most frequently associated with the lesions of rheumatic fever.

As to the clinical view, some of its supporters regard rheumatic fever as an attenuated pyemia, the exciting cause of which may be any of the pyogenic cocci. Others maintain that simple uncomplicated arthritis is due to toxins whose nature is undetermined, while the cardiac lesions are due to secondary infection with the pyogenic cocci.

There is much experimental evidence in favor of the bacteriologic view. In England, where rheumatic fever is of a particularly severe type, the great number of cases in which the micrococcus has been isolated and the great constancy and uniformity in which the complete picture of the disease has been reproduced in animals, is a strong argument in favor of the *Micrococcus rheumaticus* being the cause of the disease. Against it is the negative evidence, and the cases in which a variety of organisms has been found associated with the rheumatic lesions.

Chvostek,[21] in 1895, and Kraus,[22] in 1896, failed to obtain any organism in cultures from rheumatic fever patients. McCrae,[23] in 1903, reported blood cultures during life from a large number of cases of rheumatic fever, with uniformly negative results. He advanced the suggestion that, inasmuch as the organisms described by other observers were usually found in fatal cases, they might represent merely a terminal infection. He fails to explain satisfactorily the constancy of the experimental results in animals. Philipp,[24] in 1903, in twenty-one cultures from the blood and six from the joints, in a great variety of media, obtained negative results. Von Leyden,[25] in 1894, obtained from six cases of malignant endocarditis, supposed to be rheumatic, four cultures of streptococci differing from the *Micrococcus rheumaticus* in being very pathogenic for animals.

Sahli and Singer, who obtained a variety of pyogenic cocci from cases of rheumatic fever, are strong supporters of the clinical view. But they could scarcely ever reproduce arthritis and endocarditis in animals. von Leyden's experiments are inconclusive, while the evidence of Chvostek, Kraus, McCrae and Philipp is merely negative. In fact, all this evidence is of comparatively little value when advanced against that based on the very positive results of the English observers.

The principal argument against the specificity of the *Micrococcus rheumaticus* is the fact that it can be distinguished neither morphologically nor culturally from other varieties of streptococci. Although some of the English observers have pointed out minor peculiarities in the behavior of the *Micrococcus rheumaticus* toward various methods of cultivation, yet these are too slight to establish the separate identity of the organism. They have also advanced the Marmorek test in favor of the specificity of the organism, since the *Micrococcus rheumaticus* grows freely in media exhausted by other strains of streptococci. Recent work, notably that of Meyer[26] and of Aronson,[27] has thrown great doubt on the Marmorek reaction as a test of specificity. It must be admitted that the proof that the *Micrococcus rheumaticus* is the specific cause of rheumatic fever must rest entirely on the fact that it produces specific results in animal inoculations.

But the supporters of the clinical view maintain that this is not the case and that other varieties of micrococci can produce in animals the lesions of rheumatic fever. Menzer,[14] in 1902, advanced the opinion that rheumatic fever is one of the manifestations of a variety of organism, which under certain circumstances assume specific properties. Glaser,[28] in 1904, observer polyarthritis with other strains of streptococci. There are many reported cases of arthritis with various streptococci in which, however, the kind of arthritis is not specified. Harris,[29] in 1905, experimented with streptococci from various sources and succeeded in producing arthritis. He concludes that rheumatic fever is a streptococcus manifestation. The arthritis obtained by him in those rabbits which were autopsied was invariably purulent, and he failed to produce cardiac lesions. Cole,[30] in 1904, experimenting with streptococci from seven different sources where there was no suspicion of rheumatic fever, produced arthritis in rabbits with every strain, and twice produced endocarditis. He assumes that the claim of the *Micrococcus rheumaticus* to specificity rests on the demonstration of its ability to produce in animals arthritis and endocarditis, and that there is no essential difference in the nature of the lesions from those produced by him with other streptococci.

Beattie,[31] in his latest article, 1906, criticises Cole's conclusions. In Cole's first series of experiments, working with an organism which he admits might be the *Micrococcus rheumaticus,* he obtained results in marked contrast to his later ones. In no case was the exudate purulent, but resembled that obtained by Beattie and the other English observers with the *Micrococcus rheumaticus.* On the other hand, in Cole's experiments with other streptococci he obtained usually either a purulent exudate or turbid fluid in the joints. Cole's inoculations frequently resulted in the death of the animal from septicemia, another marked difference from the results of the other English investigators. Beattie concludes that Cole's experiments fail to prove that other varieties of streptococci produce the same results in animals as the *Micrococcus rheumaticus,* but merely show that purulent arthritis in rabbits is a frequent manifestation of streptococci injected intravenously, the result resembling a pyemia. Endocarditis is less frequent.

There is considerable further evidence in favor of the specificity of the *Micrococcus rheumaticus.* Poynton and Paine,[32] in answer to the view of Singer that rheumatic fever is an attenuated septicemia, point out that the organism is very virulent, and is found, associated with very severe forms of ulcerative endocarditis. It never produces pus nor a picture resembling that of streptococcus septicemia. Weichselbaum,[33] as early as 1889, working with various organisms, found it necessary to injure the heart valve before experimental endocarditis could be produced. Pasquale,[34] in 1893, working with streptococci, produced subcutaneous abscesses, general septicemia and a great variety of lesions, but

21. Chvostek: Wien. klin. Wochft., 1895, No. 26, p. 469.
22. Kraus: Zeits. f. Heilkunde., 1896, vol. xvii.
23. McCrae: Amer. Med., Aug. 8, 1903.
24. Philipp: Deuts. Arch. f. klin. Med., 1903, lxxvi, p. 150.
25. Von Leyden: Deuts. med. Wochft., 1894, No. 49.
26. Meyer: Berl. klin. Wochft., 1902, No. 39, vol. xl, p. 936.
27. Aronson: Berl. klin. Wochft., 1902, No. 42, p. 979.
28. Glaser: Verhandl des XIX Cong. f. innere Med., 1901, p. 471.
29. Harris: Trans. Chicago Path. Soc., June 12, 1905.
30. Cole: Jour. of Infect. Dis., 1904, No. 4.
31. Beattie: Jour. of Med. Research, vol. xiv, No. 2, p. 399.
32. Poynton and Paine: Medico Chir. Trans., London, 1903, vol. lxxxv, p. 211.
33. Weichselbaum: Ziegler's Beit., 1889, vol. iv.
34. Pasquale: Ziegler's Beit., 1893, vol. xii, p. 433.

never mentions arthritis nor endocarditis. In the *Journal of Hygiene,* April, 1903, is an account of autopsies on rabbits used in experiments on the value of antiseptics. All died from acute infection, but none showed an abnormal endocardium.

The attempts to show that other organisms can produce the specific results claimed for the *Micrococcus rheumaticus* have not resulted in any very convincing evidence. If an organism can base its claim to specificity on specific results in animal inoculations without means of identification other than these results, the weight of evidence inclines toward the *Micrococcus rheumaticus* as the specific cause of the disease. Those who regard rheumatic fever as a specific reaction of the tissues to a variety of infections may in time prove right, but at present they need further evidence to show that a variety of organisms or the streptococcus group can produce such a specific reaction. It must be admitted that these organisms can at times produce arthritis and endocarditis, but it remains to be proved that they produce the anatomic lesions and clinical picture of rheumatic fever with a constancy and accuracy approaching that seen in experiments with organisms derived from rheumatic patients.

Nevertheless, until we have some means of recognizing the *Micrococcus rheumaticus* other than by its results in animal inoculation the possibility remains that other organisms may produce specific results, though lacking in experimental support. At present it seems advisable to accept the *Micrococcus rheumaticus* not as the absolutely proven specific cause, but as the probable specific cause of rheumatic fever.

CLINICAL STATISTICS OF RHEUMATIC FEVER IN CHILDHOOD.

Inasmuch as we can not regard it as absolutely proven that there is a disease of specific etiology, to which the term rheumatic fever may be properly applied, it remains to consider whether the clinical and anatomic description of certain cardiac and articular conditions is sufficiently definite and constant to warrant the use of the term. For this purpose a detailed study was undertaken of a number of consecutive cases treated in the wards of the Children's Hospital. Every case of arthritis, endocarditis and pericarditis admitted to the hospital for a considerable period, somewhat over five years, was included in the study.

In this entire course of time only five cases occurred which were obviously due to other causes than the infection provisionally defined as rheumatic; 300 cases occurred in which no other cause was found. These 300 cases were divided into the following classes: 1, With arthritis on admission, 102 cases; 2, with endocarditis only on admission, 140 cases; 3, with pericarditis on admission, 58 cases.

From another standpoint the cases were divided as follows: 1, Acute infections, 223 cases; 2, chronic endocarditis, 77 cases.

The interest in these figures lies in the fact that they show the great frequency of rheumatic fever infection, or at least of infection of a certain type, of unknown etiology, in children as compared with cardiac or articular manifestation due to other known causes. Of still greater interest is the fact that they show the much greater frequency of cardiac manifestations in children as compared with the articular. Of the 223 cases of acute infection, there were 121 cases showing at the time of admission no evidences of the localization or manifestation of infection anywhere but in the heart.

In 30 cases there was a rheumatic family history, but only in those cases with present or recent joint symptoms were the parents particularly questioned in regard to this point.

There was no case in the entire series of 300 cases under 3 years of age. The frequency of rheumatic fever apparently increased from the third to the seventh and eighth years, and then decreased from the ninth to the twelfth.

THE ARTICULAR CASES.

These were cases having joint symptoms at the time of admission to the hospital. The first striking point was the great comparative mildness of the joint symptoms. Whereas all these children had joint pain or pain on motion, it was in general slight as compared with adults. A certain number of cases were observed with the redness, heat, swelling and extreme pain on touch or motion, so familiar in adults. But cases of this type formed a small minority of the whole number. There was distinct relation between the age of the children and the severity of the joint symptoms, the severe cases resembling the adult type being much commoner in the later period of childhood, most of them occurring in children of from 10 to 12 years. Another striking point was the brief duration of the joint symptoms after treatment was begun, although again a small minority in the older children, resembled the adult type.

Duration of Joint Pain.—One day or under, 64 cases; two days, 12 cases; three days, 14 cases; from four to six days, 10 cases; one week or longer, 2 cases.

Objective Manifestations.—Redness, swelling, heat and tenderness to pressure were very noticeably infrequent as compared to arthritis in adults, more than half showing none: No objective signs, 52 cases; redness, 30 cases; tenderness, 52 cases; swelling, 45 cases.

The next point of interest lay in the number of joints affected, which showed the comparative infrequency of marked polyarthritis. More than one joint was usually affected, the arthritis being confined to one joint in 10 cases and to two joints in 28 cases. There were but 2 cases in which all the joints were affected. The ankles were most frequently affected, then the knees: Ankles, 73 cases; knees, 60 cases; wrists, 30 cases; hips, 15 cases; shoulders, 10 cases; elbows, 8 cases; fingers, 7 cases.

A very noticeable feature was the frequency of signs of endocarditis. Of the whole number, 85 cases showed signs of valvular endocarditis, and but 17 children left the hospital with an apparently normal heart. Seventy-two cases had signs of endocarditis on admission, and 13 developed signs during the stay in the hospital. Eighty-three per cent. is a very much larger proportion of cases of arthritis to develop signs of endocarditis than is met with in adults.

A comparatively large number of the cases showing heart signs also had symptoms referable to the heart. Here, again, is a marked contrast to the rheumatic fever of adults, where cardiac lesions are so apt to develop insiduously. Only 27 patients had no heart symptoms, whereas 45 patients had precordial pain or dyspnea. Thirty patients had dyspnea and distinct signs of failing compensation, which developed during the febrile attack. Fifteen patients had precordial pain and palpitation without marked dyspnea.

In a number of cases the cardiac symptoms preceded the articular by a variable and often considerable period of time.

The modes of onset of the attack were as follows: Fever and joint pain, 67 cases; fever only (at first), 15 cases; fever and dyspnea, 10 cases; fever and precordial pain, 5 cases; fever and sore throat, 5 cases.

It may be seen from these figures that while fever and joint pain is the commonest mode of onset, nevertheless, even in the articular cases, in 35 out of 102 cases several days elapsed before the development of articular symptoms.

The following tables show the degree and duration of the febrile reaction:

TABLE 1.

	Fever on admission.	Maximum. reached.
99-99.8	0 cases.	0 cases.
100-100.8	32 cases.	17 cases.
101-101.8	20 cases.	20 cases.
102-102.8	25 cases.	20 cases.
103-103.8	15 cases.	30 cases.
104 or over.	10 cases.	15 cases.

TABLE 2.

	Duration of fever.	
Time.	Cases with cardiac symptoms.	Cases without cardiac symptoms.
1 day.	2 cases.	10 cases.
2 days.	0 cases.	19 cases.
3 days.	5 cases.	9 cases.
4-6 days.	13 cases.	11 cases.
1-2 weeks.	8 cases.	16 cases.
Over 2 weeks.	17 cases.	3 cases.

An exceedingly interesting point in connection with the duration of this fever is the fact that in general it was much longer in cases with heart symptoms. Moreover, in every one of the 17 cases in which there was no sign of any heart lesion the temperature fell to the normal within three days. On the other hand, in cases with cardiac symptoms, the duration was often notably prolonged. In comparison with the time of disappearance of the joint symptoms, this prolongation of fever becomes especially interesting. In the majority of the cases without cardiac symptoms the temperature fell to the normal with the disappearance of the joint symptoms, and in only 15 cases did it persist longer than two days after articular symptoms subsided, and in only 4 cases longer than one week. In all the 45 cases with cardiac symptoms, the fever persisted more than two days after the disappearance of articular symptoms, and in 25 cases over one week. This suggests that after the subsiding of an active infectious process localized in the joints, there may continue to exist an active infectious process localized in the heart. It also suggests that in children in whom this infectious process affects the joints and the heart, its activity persists longer in the heart, in so far as fever is a measure of the activity of the process.

CASES OF ENDOCARDITIS.

These 140 cases were diagnosed as endocarditis, from the fact that endocarditis was the only lesion found on their admission to the hospital. There were also numerous cases of endocarditis among the cases regarded as primarily articular or pericardial, so that in all, out of the 300 cases, 281 showed at some time signs of endocarditis and 19 none. While it can not be argued from these figures alone that endocarditis is a commoner manifestation of rheumatic fever in childhood than arthritis, it can, nevertheless, be inferred that endocarditis is an exceedingly common manifestation of rheumatic fever in early life.

As to the lesions seen in the 140 cases of endocarditis, the mitral valve was very much the most commonly affected. In fact, it was affected in every case but one.

Lesions.—Mitral insufficiency alone existed in 70 cases; mitral stenosis alone existed in 1 case; aortic insufficiency alone existed in 1 case; mitral insufficiency and stenosis existed in 56 cases; aortic and mitral insufficiency existed in 7 cases; aortic and mitral insufficiency, mitral stenosis existed in 5 cases.

The cases showing endocarditis as the chief manifestation are divisible into three classes as follows: 1, Chronic endocarditis with cardiac symptoms, 47 cases; 2, chronic endocarditis without cardiac symptoms, 30 cases; 3, acute endocarditis, 63 cases.

CHRONIC ENDOCARDITIS.

These patients were either admitted to the hospital on account of cardiac symptoms or were admitted for some other reason in which the cardiac lesions were discovered in the course of routine examination. Twelve patients of this latter type were admitted for chorea. Of the 47 cases with cardiac symptoms, the majority began with the usual symptoms of failure of cardiac compensation. In 8 cases the cardiac symptoms were immediately preceded by articular symptoms and fever, which had since subsided. In 2 cases the cardiac symptoms developed in the course of chorea.

The connection of these chronic cases with rheumatic fever is very noticeable.

Previous History of Seventy-seven Cases of Chronic Endocarditis.—Joint symptoms only, 32 cases; chorea only, 12 cases; joint symptoms and chorea, 14 cases; scarlet fever, 5 cases; no cause found, 14 cases.

Forty-six patients out of the 77 had had joint symptoms; in all, 28 had had chorea. In 19 cases there was no evidence of any rheumatic infection. In 5 cases the symptoms dated from an attack of scarlet fever, leaving 14 cases of chronic endocarditis in which no cause was found.

ACUTE ENDOCARDITIS.

It is not possible to determine in how many cases of rheumatic fever there is acute endocarditis. In most of the cases of acute infection already considered, in which arthritis was the principal manifestation, there was evidence of endocardial lesions. While in those patients who had had no previous attack of rheumatic fever, such evidence points toward an acute endocarditis, nevertheless in those admitted with a heart lesion, it is impossible from the history to exclude a previous attack as the cause of the lesion. From the frequent mildness of the joint symptoms, such an attack could easily have been overlooked. On the other hand, it is certain that in the 13 cases which developed a cardiac lesion while under observation, there was acute endocarditis. The special interest in connection with this form of acute infection lies in those patients who at some time while under observation were suffering from an acute febrile disease, but who showed no symptoms nor signs at that time suggesting localization of the infection elsewhere than in the endocardium. These are the cases particularly defined as acute endocarditis. Those cases admitted for articular manifestations, in which the fever and general appearance of acute infection persisted long after the articular symptoms had completely disappeared, would come under this definition. In 29 of these cases the fever persisted longer than one week, without signs other than in the heart; also, among the cases of pericarditis, 11 showed only signs of endocarditis on admission, the pericardial lesion developing later. So that of the entire 223 cases of acute infection in the series, 134 had at some time acute endocarditis while under observation, whereas only 102 had arthritis. Therefore 60 per cent. of the cases of acute infection showed the distinct appearance of endocarditis at a time when

there were absolutely no articular manifestations, but cardiac symptoms in a large proportion.

Onset in Sixty-three Cases of Acute Endocarditis.—Fever only, 3 cases; fever and dyspnea, 27 cases; fever and joint pain, 18 cases; fever and precordial pain, 3 cases; fever and sore throat, 1 case; fever and chorea, 1 case; fever, joint pain and dyspnea, 10 cases.

This summary shows the various modes of onset of these cases, the commonest being with fever and dyspnea.

The range of fever and appearance of the temperature chart in these cases is strikingly similar to the articular cases.

TABLE 3.

Temperature.	On admission.	Maximum reached.
Not taken.[35]	2	2
99-99.8	15	0
100-100.8	14	7
101-101.8	15	17
102.102.8	14	20
103-103.8	0	10
104 and over.	3	7

On the other hand, the duration of the fever shows a difference from the articular cases in general, being more apt to be long.

Duration of Fever.—One day, 2 cases; from two to three days, 15 cases; from four to six days, 3 cases; from one to two weeks, 10 cases; from two to four weeks, 5 cases; from four to twelve weeks, 8 cases; terminated fatally, 20 cases.

A very common type in children is characterized by a temperature chart of one or more weeks' continued moderate fever with no symptoms other than the cardiac.

When articular symptoms were present at the onset of the attack, they usually subsided rapidly. The cardiac symptoms, dyspnea and cough usually persist one or more weeks. Edema occurs in about 25 per cent. of cases with cardiac symptoms, chiefly in the severe and fatal cases. Precordial pain is comparatively uncommon. Articular symptoms frequently develop after a considerable period of cardiac symptoms only. Sweating, headache and digestive disturbance are not marked, although these symptoms occur at times. There may be no subjective symptoms at any time throughout the disease.

On physical examination the characteristic endocardial murmurs are heard. The cardiac rhythm is often irregular, though regular in the majority of cases. The rate is usually much accelerated, there being often a curious irritability of the heart, even in those cases where cardiac symptoms are slight or absent.

What proof or evidence is there that the cases which develop without any evidence of localization of acute infection in the joints are in any way connected with rheumatic infection? There is evidence of varying character. Of the 63 cases of acute endocarditis, 56 had some history of previous arthritis and only 7 cases had nothing to connect them with rheumatic fever, except their own clinical picture. But there is a strong presumption that these 7 cases also were actually manifestations of the same infection, for their clinical descriptions were precisely similar to those of the cases which had had a previous or shortly preceding arthritis, and were widely different from 3 cases of malignant endocarditis due to the pyogenic cocci, observed during the collection of the series, but not included. The chills, irregular fever, often extremely high, and the metastatic suppurations observed in these malignant cases bore no resemblance to the fairly regular temperature chart, moderate fever and absence of symptoms other than cardiac in the 7 cases under discussion. Moreover, there were in the series a number of cases which for many days ran a course precisely similar in every way to these 7 cases, but which suddenly, in the course of the disease, proved themselves to be rheumatic by developing joint symptoms for a brief period. It seems probable that these 7 cases were due to the same infection, but in them the articular manifestations did not happen to develop.

The most striking type in the rheumatic fever of childhood is the primary endocarditis. By this is meant those cases of acute infection in which endocarditis is the first, and for a time or throughout the only rheumatic manifestation. There were in the series of 63 cases admitted for endocarditis 35 cases of this type. Fifteen had had previous arthritic attacks, but at a period too remote to have any connection with the present infection, during the entire course of which there was no other localization. Thirteen developed articular symptoms subsequently to a varying period of fever and cardiac symptoms. The remaining 7, as we have already seen, had no other localization of infection at any time. In these cases of primary endocarditis, a child has an attack of fever, seems unwell; there are usually cardiac symptoms, frequently dyspnea and cough. After a varying period the fever subsides, while the cardiac symptoms may or may not persist. During the attack there may develop joint pain, usually of very brief duration. Occasionally an attack of chorea develops in the course of, or shortly after, the febrile attack.

It must be remembered that sometimes there are no symptoms at all, or slight precordial pain only. There is simply fever and a heart murmur. Such cases are frequently diagnosed as grip or febricula, the heart murmurs not falling under suspicion of connection with the present infectious process. After a time fever subsides and the child may be sent home without a satisfactory diagnosis having been made. There were three cases in my series of precisely this character. I have learned that every one of these patients, within a year after discharge, had an attack of arthritis and one of them had chorea. The possible rheumatic origin of cases of this kind should be recognized and the frequency of acute endocarditis as the only manifestation of rheumatic fever in childhood should be remembered. Given such a case, in the absence of any other demonstrable cause the case may be safely ascribed to rheumatic fever; and if these cases are followed the tendency to recurrent manifestations of various kinds will often prove the diagnosis correct.

ACUTE PERICARDITIS.

There were 58 cases of this kind of localization of the infection. In 3 the records were partly unsatisfactory.

Mode of Onset.—A. Cases with pericarditis on admission, 45 cases; fever, precordial pain, dyspnea and cough, 27 cases; fever, joint pain, dyspnea, precordial pain, 8 cases; fever, joint pain, precordial pain, 7 cases; unknown, 3 cases.

B. Cases with acute endocarditis only on admission, 13 cases; fever and joint pain, 3 cases; fever and dyspnea, 10 cases.

Fever and precordial pain are almost invariable accompaniments of acute pericarditis at its onset. There may be dyspnea and cough also. In some cases at the onset there is also joint pain. Other cases, in which the localization of the infection in the pericardium occurs later, may begin with fever and joint pain only, or fever and dyspnea, and show for a time only evidences of endocarditis, arthritis, or both.

35. These patients were brought in moribund.

The symptoms and signs of acute pericarditis in children show no notable difference from those in adults. Dyspnea is apparently largely independent of the presence or amount of effusion, but seems rather to a certain extent to be a measure of the severity of the infection. Of course, there is usually a notable increase in the dyspnea when effusion is sudden, or suddenly becomes marked, but very severe dyspnea occurs without signs of effusion, and on the other hand, there were in my series a number of cases with appearances of a very large effusion, in which dyspnea was comparatively slight. It is known that myocarditis is a frequent accompaniment of acute endocarditis and pericarditis. Is it not possible that the presence and severity of the dyspnea may be dependent on the presence and severity of the accompanying myocarditis, as well as of effusion?

TABLE 4.

Temperature subnormal.	Fever admission.	Maximum.
	5 cases.	5 cases.
99-99.8	5 cases.	5 cases.
100-100.8	12 cases.	2 cases.
101-101.8	23 cases.	10 cases.
102-102.8	3 cases.	8 cases.
103-103.8	5 cases.	18 cases.
104-104.8	3 cases.	10 cases.
105 or over.	0 cases.	3 cases.

TABLE 5.—DURATION OF FEVER.

Time.	Cases.	Termination.
1 day.	0 cases.	..
2-3 days.	2 cases.	..
4-6 days.	7 cases.	2 died.
1-2 weeks.	13 cases.	3 died.
2-4 weeks.	10 cases.	3 died.
4-12 weeks.	19 cases.	5 died.

Fever is about the same in degree, but persists much longer in the pericardial infections than in the endocardial infections, and at times may last five or six weeks.

On admission, 22 cases gave signs of fibrinous pericarditis only, and 36 of effusion. Of the fibrinous cases, 13 subsequently developed effusion, while 9 remained dry.

Most of the cases of pericarditis showed signs of endocarditis also; 48 showed endocardial murmurs on admission. Of the 10 showing no endocardial murmur on admission, 8 developed signs of mitral disease subsequently.

Three cases of pericarditis showed chorea on admission, with a history of its having developed subsequently to the pericarditis. Two cases developed chorea while under observation. Two patients had had chorea shortly before the pericarditis, and 3 had had previous attacks of chorea.

The evidence in favor of the pericarditis being a rheumatic manifestation is fairly strong: A. History of joint symptoms, 33 cases; previous attacks, 13 cases; shortly preceding the pericardial symptoms, 10 cases; accompanying the pericardial symptoms, 7 cases; developing after the pericardial symptoms, 3 cases.

B. No history of joint symptoms, 25 cases; chorea, 10 cases; tonsillitis or sore throat, 5 cases; no rheumatic manifestation, 10 cases.

Those cases in which the connection with the general picture for rheumatic fever is not clear, precisely resembled in their clinical course the cases in which the pericardial manifestations were associated with arthritic manifestations. A number of cases were aspirated, including several of those without other rheumatic manifestations. The fluid was always serous, never purulent. There was a marked contrast clinically between all these cases and 2 cases of purulent pericarditis which occurred during the same period. Both of these latter complicated pneumonia and showed a temperature chart with a high, widely varying fever, and a septic condition very different from the cases in the series.

Primary pericarditis, that is, pericarditis without other manifestations, is fairly common in children. There were 30 cases, in which pericarditis alone or pericarditis with endocarditis, were the sole manifestations of infection. They are analogous to the cases of primary endocarditis already considered. In some of them there were several days of fever before any definite symptoms developed, then precordial pain and dyspnea followed. This point should be remembered. If a child is suffering from an acute febrile disease, if a friction rub is heard, the diagnosis of rheumatic fever is probable. If no friction rub is heard, the possibility of rheumatic fever should still be remembered, as any one of its three principal manifestations may subsequently develop. There were numerous cases of this kind in the series. A child is seen with a mild febrile attack, perhaps slight headache, and vague pains in the limbs, but nothing abnormal on physical examination. One such patient, a girl, was discharged with the diagnosis grippe. On the evening after discharge she had a rise of temperature and severe precordial pain, and returned to the hospital the next day with a dry pericarditis. Later an effusion developed and an endocardial murmur. After two weeks she had severe pain in the knees and shoulders, lasting two days. Fever persisted four weeks. About the time the temperature reached normal she developed chorea.

CHOREA.

The frequent occurrence of chorea in the series is strongly in support of its rheumatic origin. There were 86 cases of the 300, or 29 per cent., which gave a history of chorea. There is, of course, no evidence that chorea is always a rheumatic manifestation, as a large number of cases were admitted into the hospital during the period without other rheumatic manifestations: Admitted for chorea, 121 cases; existing or previous rheumatic fever, 69 cases; no rheumatic history, 52 cases.

Even including all the cases admitted for chorea during the same period, 57 per cent. were in patients with some rheumatic history.

The chorea does not seem to bear any definite relation in time to the infection. At times it occurred in previous attacks, at other times it shortly preceded or followed the manifestations of infection.

It is possible that chorea may be the result of the action of toxin on the nervous system, as diphtheritic paralysis is the result of the action of the diphtheria toxin. This theory, however, does not explain the cases in which chorea precedes the cardiac or articular manifestations. With the tendency of rheumatic fever in children to take the form of recurrent mild infections, it is possible that there may have been an infection preceding the chorea, which was overlooked. It is also possible that such a mild infection might not even produce fever, or any signs of infection, other than the mere physical sign of endocarditis. This would explain the development of a cardiac murmur in cases of chorea under observation in which there is no other evidence of an active infectious process. That chorea can occur without evidence of rheumatic infection, or as the result of fright or other recognizable condition is no argument against the analogy of chorea with diphtheritic paralysis, as a manifestation of specific infection, for neuritis and paralysis can also occur from other causes.

THE THROAT IN RHEUMATIC FEVER.

A great deal of attention has recently been directed toward the throat in rheumatic fever, both as the portal of entry for and the seat of development of the infecting agent. As early as 1789, Eyerlen, in his "Materia Rheumatica and Tonsillas Deposita," recognized a relation between rheumatism and the tonsils. Roos,[36] in 1894, called attention to the frequent connection of acute rheumatism and tonsillitis. Block[37] called attention to the same point in 1898. The experimental work of Widal and Bezancon,[8] Meyer[13] and of Menzer[14] has already been mentioned.

There is great difficulty in obtaining clinical evidence on this point. Children frequently do not complain of sore throat, even when considerable inflammation is present, and always the evidence of the parents is of little value. In spite of these obstacles, during the latter part of the period covered by this series of cases, special pains were taken to collect data on this point. In the whole series of 300 cases, 98 gave a history of sore throat: Frequent previous attacks, 65 cases; preceded rheumatic manifestations, 13 cases; present at the onset, 20 cases.

SPECIAL PECULIARITIES OF RHEUMATIC FEVER IN CHILDHOOD.

In considering as a whole the acute infection in its varied manifestations making up this conception of rheumatic fever, certain facts stand out as marked peculiarities of the disease in early life:

1. The comparative mildness of the articular manifestations.

2. The relative frequency of cardiac manifestations.

3. The large number of cases in which there are only cardiac manifestations. This number is actually greater than the number of cases having only articular manifestations.

4. The frequent occurrence of endocarditis or pericarditis as the primary manifestation.

5. The most severe manifestations are the cardiac. In acute endocarditis, and to a still greater degree in acute pericarditis, the severity of the case, as measured by subjective discomfort and duration of fever, as well as by danger to life, is greater than in acute arthritis.

6. The marked tendency to recurrent attacks, with varying manifestations. A very large number of the patients had had frequent attacks of fever, with articular or cardiac symptoms, previous to the attack for which they were then under treatment. It is not uncommon for a child to have arthritis at 4 years; a febrile attack with dyspnea and precordial pain at 5; several attacks of fever, joint pain and dyspnea during the next three years; chorea at 9, and again the following year; and finally, acute pericarditis at 11. These recurrent attacks show no particular order of occurrence. Sometimes the first is the most severe; sometimes the mildest. At times chorea occurs first; at times arthritis, at times fever and dyspnea, at times pericarditis. Sometimes joints, endocardium and pericardium are affected together; at other times endocarditis may occur alone, to be followed after months or years, by an articular attack, and later still by a pericarditis. The whole of childhood seems to be a period when, at various times, endocardium, pericardium and articular synovial membrane are particularly susceptible to this infection.

7. A seventh point suggested by a study of the rheumatic fever of early life is interesting in connection with what is known as "broken compensation." Many of our text-books, in speaking of valvular disease of the heart, say rightly that the lesion is compensated by cardiac hypertrophy, but they go on to say that the symptoms, dyspnea, edema, etc., are caused by failure of this compensation, and mention overexertion as the chief cause of this condition of broken compensation. The throwing of more work on a heart with damaged valves by overexertion, or by an increase in the resistance in the peripheral circulation, is made the most prominent cause of these symptoms.

After studying the cases of so-called broken compensation in my series, I became convinced that as far as this condition occurs in children, the above statements in the books cover only one side of the question, and that not the most important. Obviously, the symptoms can only occur from inability of the heart properly to perform its work. But the idea that the failure is due to the valvular lesion plus more work required does not seem to conform to the facts. In my series 121 cases had signs of so-called broken compensation. Of these, 49 patients were suffering from acute endocarditis only, and 25 from acute arthritis and endocarditis at the time when the compensation failed; that is, in 74 cases the symptoms called failing compensation dated from and accompanied an acute rheumatic fever infection. In 10 further cases there was a history of a shortly preceding infection, so that in 84 cases out of the 121 the cardiac symptoms seemed to be caused by or at least to follow acute infection. In only 2 cases was there any history of overexertion. On the other hand, none of the cases of chronic endocarditis without heart symptoms gave a history of any shortly preceding infection.

A natural inference is that the principal cause of the development of cardiac symptoms in childhood is not overexertion, but a fresh infection. That this fresh infection is effective as a cause by increasing the valvular stenosis or insufficiency is not probable, because many cases of acute endocarditis show severe cardiac symptoms from the start, before there is much probability of marked damage to the valves, and sometimes even before the advent of the murmur. While it is possible that any infection may increase the work thrown on the heart in some way, this would hardly explain the specially severe cardiac symptoms so frequently seen in the acute endocarditis of early life. It seems probable that the heart in these cases of rheumatic fever is weakened by an accompanying myocarditis, in accordance with the well-known fact that myocarditis is a frequent accompaniment of acute endocarditis. In such a condition it is very possible that the rôle of the valvular lesion in contributing to the failure of the heart to do the work required is very slight; and in any event it seems that the view of disturbance of a condition of compensation developed on account of a valvular lesion by increased demands on the heart, as a cause of symptoms, is by no means established. The term cardiac insufficiency is suggested as preferable to broken compensation in that the latter points to the damaged valve as the chief agent in producing the condition. However its mode of action, the evidence is very strong that the fresh acute infection is usually the chief agent.

A number of convalescent cardiac cases are from time to time sent to the Convalescent Home of the Children's Hospital at Wellesley. At one time these children were allowed to play and run about more than is proper for cardiac cases. I know of no child who developed cardiac insufficiency from overexertion at the Convalescent

36. Roos: Berl. klin. Wochft., 1894, Nos. 25 and 26.
37. Bloch: Münch. med. Wochft., 1898, Nos. 15 and 16.

Home. Several patients did develop such symptoms there, but in every case the symptoms were ushered in by a fresh febrile attack, a recurrence of infection in short, both with and without articular manifestations. I do not wish to imply that precautions against overexertion in cardiac cases should be relaxed, but simply to point out that recurrence of infection, being so important a cause of heart failure, at least an equal amount of attention should be paid to so regulating the child's life as to exposure, etc., as to minimize as far as possible conditions favorable to fresh infection with rheumatic fever.

DIAGNOSIS OF RHEUMATIC FEVER.

The figures in this series of cases give some indication of the frequency of occurrence in early life of arthritis, endocarditis and pericarditis of a certain type, as compared with other types. The particular type described above is overwhelmingly the most frequent. Given, therefore, any case of acute arthritis, especially if there are the physical signs of endocarditis, or given any case of acute infectious disease in which there are no other evidences of localization than in the endocardium or pericardium, the probability is strong in childhood that it is a case of rheumatic fever. A history of previous cardiac or articular attacks, or of recurrent attacks, strongly increases this probability. Chorea and sore throat, either previous attacks, or as an accompanying manifestation, also increases this probability. On the other hand, the clinical picture seen in endocarditis and pericarditis due to the pyogenic cocci, is very different from that in the type which forms the majority of cases, and can easily be recognized. In those much less common cases of endocarditis, pericarditis or arthritis which occur as complications of other recognized infections, the cause of the cardiac and articular processes is obvious. In cases with no recognized other cause, we probably have to do with rheumatic fever.

PROGNOSIS.

In this series of 300 cases, 55 died in the hospital, making the mortality of rheumatic fever in hospital cases, judged from this comparatively small number, as high as 18.33 per cent.; 10 fatal cases, however, showed no evidence of acute infection while in the hospital, although in most of them the beginning of cardiac failure which ultimately caused death dated from an infectious attack. Taking the 223 cases of acute infection in the series of which 45 were fatal, the mortality was 20 per cent. This figure is much higher than in adults, where acute infection is more exclusively confined to the joints. I think many physicians do not realize that in a case of rheumatic fever in early life the chances of death may be as high as one in five.

If all the 300 cases were followed throughout their subsequent years of childhood, I think it very possible that the mortality might be still higher: Cardiac failure was the cause of death in all cases. Of the articular cases 7 died, or 7 per cent. Of the acute endocarditis cases, 20 died, or 14.3 per cent. Of the acute pericarditis cases, 18 died, or 31 per cent.

The fatal articular cases all had acute endocardial manifestations. As a whole, they represent the mildest form assumed by rheumatic fever in early life. But in such a case with cardiac symptoms the prognosis is the same as in the cases of acute endocarditis. The severest form is pericarditis, with a high mortality.

Only 17 patients in the entire series were discharged well. The remainder were discharged with a valvular lesion.

THE RELATION OF THE CLINICAL PICTURE IN CHILDHOOD TO THE THEORIES OF THE NATURE OF THE DISEASE.

The chief characteristic of the clinical picture in childhood is its definiteness and the strong resemblance of all the cases one to another. The general course, range of temperature, symptomatology, recurrences, associated manifestations, give a picture strongly suggestive of a definite disease. If this clinical picture merely represents a specific reaction of the body to various causes, it must at least be admitted that the reaction is very specific. It rather suggests an infection, and more, a specific infection, in which the infecting agent has a marked tendency to select constantly, and over and over again certain definite parts of the body. Whatever its portal of entry, it localizes itself with a remarkable constancy in the synovial membranes of the joints, in the endocardium and in the pericardium. When it has so localized itself, it produces a definite and constant febrile reaction, and definite and constant lesions, chiefly a non-purulent inflammation. A certain number of these causes came to autopsy. The finding showed only minor deviations, being essentially the same pathologic process, which has for years been described as occurring in acute rheumatic arthritis, endocarditis and pericarditis.

That these lesions can be produced by the organisms is possible, but remains to be further proved. There is at least a marked contrast between the lesions in all these cases and those produced by the ordinary virulent pyogenic cocci. The severity of the cardiac manifestations points toward a virulent infection, and hence is against the view that the manifestations are due to a variety of pyogenic cocci in an attenuated form.

I think the definiteness of the clinical picture alone is sufficient justification for regarding rheumatic fever as a definite entity, and most probably a specific infection to be placed in the same category as scarlet fever and measles.

Whether the specific cause has been discovered is another matter. The fact that the *Micrococcus rheumaticus* has not been proved to be the specific cause must be admitted, but it must also be admitted that its claims are strong. When those who deny that it is the specific cause base their denial on the ground that specific results in animal inoculations are not to be taken as a criterion of specificity, and require a further method of differentiating this organism, they are right, but are only pointing out that the chain of proof is not absolutely complete. If we assert only the probability of its being the specific cause, a probability based on the experimental and clinical evidence in support of this position, a certain burden of proof is thrown on those who believe otherwise. In so far as they can show that other organisms give experimental and clinical results identical with those constantly produced by the micrococcus isolated from cases of rheumatic fever, they lessen this probability. Up to the present so little has been done in this direction that there is justification for the provisional acceptance of the *Micrococcus rheumaticus*.

[FOR THE DISCUSSION ON THE PAPERS OF DRS. SNYDER AND DUNN, SEE PAGE 542.]

Mind in Medicine.—Medical psychology, therefore, can no longer be limited to pathologic psychology, but must embrace the whole study of the connection of the sound mind with disease both in cause and cure. It is, indeed, true that this connection is everywhere tacitly acknowledged, everywhere exploited by quacks, and yet that it is nowhere taught in our schools or scientifically studied.—Schoefield, in *Brit. Med. Jour.*

AUTOINTOXICATION IN RELATION TO THE EYE.*

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INTRODUCTION.

Observers differ, often widely, in their conception of autointoxication; hence it is necessary first to describe, briefly at least, what is included in the term in so far as the present contribution is concerned.

As W. Louis Chapman[1] points out, "the variety of definitions given for this state bears testimony to the difficulty of obtaining one which is terse yet comprehensive." The one advocated by Albu[2] is as follows: "Autointoxication is a poisoning of the organism by the products of its own metabolism, which may be normal, but accumulated in excessive quantities, or they may be abnormal. Among the latter it is necessary to distinguish between those which are subject to further transposition, and those which are formed not at all or only in slight degree in the healthy organism."

Food in its passage from the mouth to the large intestine is subject to complex chemical processes which include oxidation, reduction, decomposition and synthesis. The results are the end products of assimilation, water, inorganic salts, urea, uric acid, etc. Between the introduction into the mouth of nourishment and the appearance of these ultimate substances occurs the development of the intermediary products of metabolism, called by Gautier the leucomaines. Normally, they are oxidized, reduced, decomposed, or united with other substances in the body. Abnormally, if the outlet of metabolism meets with a check, they accumulate and are reabsorbed, and have been thought to hold etiologic relation to a number of disease-processes.

The matter, however, does not end here. During the transposition processes which are going on in the human organism, there are produced not only useful and indifferent substances, but also injurious and poisonous products. Under normal conditions they create no evident disturbance, because they are formed only in very small quantities, or in marked attenuation; or they unite with other substances, or are rapidly expelled. Under abnormal conditions and in the presence of the failure in action of the inhibitory processes, the injurious and toxic action of the imperfectly oxidized products of metabolism is evident; in other words, autointoxication of the organism. Thus writes Albu, and it is from his introduction to this subject that the preceding statements have been quoted.

Let us see for a moment how the subject is approached by others. Von Jaksch[3] distinguishes (a) retention-toxicoses, with clinical (morbid) symptoms depending on the retention of physiologic bases; (b) noso-toxicoses, referable to the presence of basic products, which are formed in the organism (blood, etc.) in disease and eliminated with the urine; (c) autotoxicoses, with clinical symptoms which are caused by the formation of toxic basic substances from morbid materials, such as pathologic fluids present in the body, which bases are absorbed and give rise to manifestations of severe poisoning; and (d) exogenous toxicoses, with clinical symptoms or morbid entities due to toxic basic substances ingested with the food, such as the poison of sausages and cheese. Other authors, for example Albu, are unwilling to accept without modification von Jaksch's classification, or to agree with him and others; for instance, Kobert, Schwalbe and Bouchard, who count among the autointoxications all those diseases which arise from the action of a *contagium vivum*, that is, all the infections, or infectious diseases. Albu, also, and it would seem properly, wishes to strike from the list of autointoxications nutriment poisonings by flesh, sausage, cheese, mussels, etc., which Bouchard[4] includes. As Chapman[1] puts it: Specific infectious diseases must not be included with autointoxications; only substances which originate in, or are elaborated within, the system should be regarded as causing autointoxications. Thus, mussel or sausage poisoning is a different process from intestinal putrefaction in which poisonous diamins are formed within the bowel lumen. In other words, autointoxication must not be confounded with autoinfection.

Although some authors would designate as autogenetic diseases only such as originate within the living cell itself and have gone so far as to regard the contents of the intestinal tract as being outside of the organism and, therefore, not participants in the condition under discussion, this ultra view is not accepted by the best authorities. It is true that putrefaction and decomposition of the intestinal contents are referable to the action of bacteria which have been introduced into it; but the autointoxications which arise from the poisonous substances thus produced differ from the infectious diseases caused by bacteria because the latter represent specific intoxications of the organism, while the former come into existence as the result of conditions which constantly obtain in the organism (Albu).

The classification adopted by Albu is as follows: (1) Autointoxication caused by loss of function of an organ, e. g., myxedema, pancreatic diabetes, Addison's disease, acute yellow atrophy of the liver; (2) autointoxication due to general abnormalities of metabolism, e. g., gout, oxaluria, etc.; (3) autointoxication from retention of physiologic products of metabolism in various organs of the body, e. g., toxic phenomena after extensive burns, carbonic acid poisoning in difficult respiration, uremia, etc.; (4) autointoxication caused by overproduction of physiologic and pathologic products of the organism, e. g., acetonuria, coma of diabetes, etc. In a position between groups three and four, and probably belonging to both, are the great majority of the autointoxications which proceed from the intestinal tract.

AUTOINTOXICATION AND THE EYE.

Let us next briefly review this subject from the standpoint of those who are especially concerned with its relationship to the eye. Uhthoff[5] divides the autointoxications into: 1. Intestinal or enterogenous, (a) caused by affections of the digestive tract which lead to abnormal fermentation and decomposition processes; (b) caused by abnormal changes resulting from the presence of intestinal parasites (helminthiasis, etc.). 2. Histogenetic, (a) caused by the products of individual metabolisms (diabetes, gout, uremia, carcinoma, chlorosis, pregnancy, puerperium, lactation, etc.); (b) caused by insufficient elimination of the poisons of the

* Read in the Section on Ophthalmology of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

1. Chapman: "Autointoxication as a Cause and Complication of Disease," Fiske Fund Prize Essay, p. 9.

2. Albu: "Ueber die Autointoxicationen des Intestinal Tractus," Berlin, 1895, p. 3.

3. Jaksch, R. von: "Clinical Diagnosis." Fifth English edition, edited by A. E. Garrod, 1905.

4. Bouchard: "Lectures on Autointoxication in Disease." Translated by Thomas Oliver, 1905, p. 159.

5. Graefe-Saemisch: "Handbuch der gesamten Augenheilkunde," second edition, 32-34, 1901, p. 179.

body as the result of disease of certain organs (thyroid, adrenals, liver, hypophysis (?)).

Elschnig,[6] the most recent systematic writer on the subject from the ocular standpoint, after reciting the classifications of von Jaksch and Uhthoff, already quoted, points out that thus far diseases of the eye of probable autogenetic origin have almost exclusively been brought into association with the affections which belong to the histogenetic autointoxications. The intestinal autointoxications have received little notice either in general ophthalmic literature or in ophthalmic text-books, and he, therefore, records the results of his study of such diseases of the eye which have come under his observation and which may have etiologic relationship to this variety of autointoxication. In order to make clear his viewpoint, he quotes Weintraud's[7] definition: "Gastrointestinal intoxications in the most restricted sense of the word are those conditions in which poisonous substances, foreign to the normal metabolism, are produced in the gastrointestinal canal by reason of abnormal fermentation, and are reabsorbed in such quantities that they call into existence pathologic phenomena. It is further to be understood that products of normal indigestion, if produced and reabsorbed in abnormal quantities, may also lead to autointoxication."

While it is admitted that certain diseases and certain symptoms are the result of autointoxication, in the present state of our knowledge it is not possible to indicate the exact nature of the toxic product which causes any autotoxemia, save one. In this connection it is interesting to quote from Alonzo Taylor:[8]

"We do not know the entity of a single autointoxication except the acidosis of diabetic coma. We do know that no known autointoxication is to be attributed to any known end product of any known metabolism. Bouchard's work on the toxicity of the urine is untrustworthy, and there is no measurable toxicity in the urine apart from that of the electrolytes. All our present knowledge rests on clinical analogy. When a nephritic suddenly becomes blind without a retinal lesion we say that he has a toxic blindness; until we have objective criteria of the assumed autointoxication we are limited to clinical analogies and these are naturally to be used with the greatest caution, since they are subject to no known objective control. Of course, autointoxications exist, probably in plenty, but of their true nature we know nothing."

For the sake of the discussion of the subject, we may divide ocular conditions to be considered from the standpoint of autointoxication into those which occur in connection with diseases which are believed to be the result of such a condition, and, in turn, to divide these into two sub-groups, that is to say, again quoting from Taylor: "Psychoses being excluded, any visual abnormalities that exist independent of structural lesions and conditions of probable autointoxication, such as uremia, diabetes, tetany, etc., might reasonably be termed symptoms of autointoxication." In the second group would appear such structural lesions in the eye that arise in connection with diseases of quite certain nature as autointoxication, namely, nephritis, diabetes and the essential anemias. With these we are familiar, although we do not know how the nephritis or diabetes or pernicious anemia causes the retinal alterations any more than we know how diabetes causes gangrene, how pernicious anemia creates spinal sclerosis or how nephritis originates endarteritis. With such phenomena of autointoxication the present communication is not concerned. We are, therefore, limited to the discussion of various ocular diseases, which, other etiologic factors being eliminated, seem, largely by reason of therapeutic tests and not from knowledge of any exact product, to be the result of an intestinal toxemia, or to be caused by an enterogenous decomposition product.

If we are to assume an autointoxication of gastrointestinal origin as a probable etiologic factor in any ocular disease, it is necessary to know some sign by which such enterogenous decomposition may be recognized. The most definite symptom, as Elschnig points out, is the presence of abnormal organic compounds in the urine, for example, phenol and conjugate sulphates, substances which are difficult to test. Easier of recognition is indican, the presence of which in increased and persisting amounts in the urine indicates decomposition of albumin in the digestive tract. To be sure, it is present in fevers, in anemia, in leukemia and even in neurasthenia, but it is said not to be present during simple constipation. It is this presence of indican which Elschnig regards as the best test of disturbances in the alimentary canal and the production of products the reabsorption of which gives rise to the toxemia to which he attributes the influences that bring about various ocular conditions, and in his experience the corneoscleral region and the uvea are most likely to suffer.

DISEASES OF THE OPTIC NERVE AND RETINA.

Referring to the possible relation of autointoxication to diseases of the optic nerve and retina, Uhthoff expresses the opinion that, while histogenetic autointoxication, with which the present paper is not concerned, may cause diseases of these tissues, intoxication of intestinal origin is almost entirely innocent of such etiologic relationship, although he is willing to admit that it may originate affections of the interior ocular muscles.

That retrobulbar neuritis may occasionally be the result of an intoxication which proceeds from the intestinal tract is indicated by Kraus' case, to which Elschnig[9] makes reference. A woman became suddenly blind, with all of the symptoms of retrobulbar neuritis. Eight days later she died, and autopsy failed to reveal any cause for death save gastrointestinal catarrh. The urine contained neither sugar nor albumin, but 25 per cent. of oxybutyric acid, and Kraus believes it probable that in this case an acid intoxication of intestinal origin was responsible for the symptoms and for the death of the patient.

Of much more importance is the possible relationship of intestinal toxemias to the development of so-called toxic amblyopia, that is to say, to the ordinary tobacco-alcohol amblyopia. I discussed this subject some years ago,[10] and pointed out that it was quite possible that nicotin or one or more of the many principles freely present in tobacco smoke liberate some toxic influence in the system which must be held accountable for the disease, which, in other words, depend on a species of autointoxication. Long ago Horner contended that neither alcohol nor tobacco as such was the direct toxic agent in cases of central amblyopia, but that together

6. Elschnig: Klin. Monats. f. Augen., vol. xliii, No. 2, 1905, p. 417.

7. Weintraud: "Gastrointestinale Autointoxicationen," Lubarsch u Osterag, Ergebnisse, vol. iv, 1897.

8. Personal communication, Dec. 31, 1905.

9. Elschnig briefly recapitulates this case because, according to him, it appears to be unknown in ophthalmic literature. Edsall and I, however, have used this case in connection with our report of the examination of urine in cases of tobacco amblyopia, Trans. Amer. Ophth. Soc., 1903.

10. Norris and Oliver: "System of Diseases of the Eye," vol. iv, p. 183.

these drugs produced chronic gastric catarrh, which, in its turn, established a chronic anemia of the optic nerve, terminating in the pathologic changes which are found in this disease. Sachs maintained that even in the pure tobacco cases certain complex chemical combinations occur in the stomach, and that there was a resulting transformation of the normal gastric juices into acids of the fatty type, which combined with nicotin into substances which were more injurious than the simple tobacco bases themselves. Förster and Groenouw have also referred to disturbances of appetite and inanition as factors in the production of this amblyopia, and Elschnig himself is able to confirm Sachs' statement of the constant presence of gastrointestinal disturbances in association with alcohol-tobacco amblyopia. So far as I know, only Edsall and I have thus, up to this time, tried to prove this suspected relationship to the amblyopia by an analysis of urine,[11] the results of which were reported to the American Ophthalmological Society in 1903. Seven cases of tobacco-alcohol amblyopia were carefully examined, with the following findings:

Case 1—High increase for conjugate sulphates, temporary intense indicanuria and slight urobilinuria. Case 2—Intense urobilinuria. Case 3—Moderate urobilinuria and high volatile fatty acids. Case 4—Moderate urobilinuria, marked indicanuria, decided reaction for phenol and high volatile fatty acids. Case 5—Intense indicanuria, moderate increase of conjugate sulphates, marked urobilinuria. Case 6—Intense urobilinuria and indicanuria and intense phenol reaction. Case 7—Marked reaction for phenol and notably high values for volatile fatty acids, with slight urobilinuria.

The results in general show that there was in all cases an excessive excretion of enterogenous decomposition products in the urine, and in all there was a more or less marked urobilinuria. In all the patients repeatedly examined these abnormalities nearly or quite disappeared under treatment, coincidentally with improvement in the eye conditions. A case of optic nerve atrophy examined as a control, the atrophy not being caused by tobacco and alcohol, showed almost entirely negative results, with only a slight reaction for indican and none for phenol. We stated that these facts gave just ground for the belief that toxic substances produced in the digestive tract, or in the course of metabolic processes, have at least a part in the production of amblyopia in these cases, and that at times they are probably the direct cause of the continuance of the symptoms when the latter do not appear after alcohol and tobacco have been stopped.

An amblyopia without ophthalmoscopic change in association with obstinate constipation has been attributed to an autointoxication proceeding from the intestinal tract by Young. Bulson[12] attributes the visual disturbances caused by excessive use of coffee (coffee amblyopia) to irritation of the digestive tract, created by this agent and consequent processes of decomposition and abnormal fermentation.

Elschnig refers to cases of scintillating scotoma and other neurasthenic symptoms which are seen in association with chronic intestinal catarrh and constipation, but very properly casts doubt on this etiologic factor, inasmuch as it is not proved that they may not be reflex manifestations from other sources, or from the intestines themselves, but not the indications of an absorbed poison.

11. de Schweinitz and Edsall: "Concerning a Possible Etiologic Factor in Tobacco-Alcohol Amblyopia, Revealed by an Analysis of the Urine of Cases of this Character."

12. Bulson: Amer. Jour. of Ophth., vol. xxii, 1905, p. 55.

OCULAR MUSCLE ANOMALIES.

When all other causes for the presence of an exterior ocular muscle palsy have been excluded, it has been attributed at times to an autointoxication, but without any very definite examinations to justify the diagnosis. Paralyses of the interior ocular muscles are probably more likely the result of gastrointestinal intoxications, and their symptoms would not in any sense differ from those which are caused by ptomain poisoning, which, as we have already noted, is not to be reckoned among the autointoxications.

I have seen several cases of unexplained paresis of accommodation apparently follow the ingestion of pure foodstuffs, that is to say, the ingestion of food which was not in any sense tainted, and doubtless all of us can recall similar examples in our practice. Some years ago, before the ophthalmic section of the College of Physicians of Philadelphia, Dr. Charles Herman Thomas exhibited a young man who always an hour after food suffered from paresis of accommodation. The subsequent history of the case I do not know. In none of these cases, however, has accurate urinary analysis been made, and they, therefore, are only classified in this group because other etiologic factors were not evident. Elschnig records a more carefully examined case of cycloplegia and loss of the pupil light reflex in a patient whose urine showed marked indican reaction, and who had no other cause for this condition, and who promptly recovered under treatment directed to the digestive organs.

Elschnig refers to one case of ocular muscle palsy reported by Varese without greater detail, in which the condition was attributed to an intestinal intoxication as the result of helminthiasis. Such intoxications are classified by Uhthoff under the autointoxications, the second group of them, at least, but more properly, according to Elschnig, they should be brought into relationship with the noso-toxicoses of von Jaksch's classification.

AFFECTIONS OF THE CORNEA AND SCLERA.

That a certain number of corneoscleral affections may possibly be referred to the action of toxins absorbed from the intestinal tract seems likely, the difficulty being, however, to eliminate other factors which are well established in their etiologic relation. A case in point is quoted by Elschnig of relapsing marginal ulceration of the cornea with increased indican reaction in the urine, and with cure which followed a careful diet and a regulation of habits tending to correct the abnormal intestinal fermentation. It certainly must be the experience of all ophthalmologists that regulation of the diet, intestinal antisepsis, and in general terms, what I may call gastrointestinal hygiene, is of the greatest moment in the treatment of relapsing corneal ulcers, especially in children and young adults, but that these corneal lesions should be designated as symptoms of the autointoxication is not by any means certain, although if persistent urine analysis persistently gave the indications of enterogenous decomposition and other factors were eliminated, such relationship would at least be probable.

Exactly the same remarks apply to various forms of scleritis, both of the deep and superficial variety and to that form which is known as the periodic fugacious episcleritis, the "hot eye" of the English writers. In these diseases the regulations of diet, etc., which have been referred to are of the greatest moment in treatment.

These types of scleritis and keratitis have recently been the subject of a brief communication by Frederick

Grover,[13] and he is satisfied, using the method of Obermayer for indican reaction, that its persistent presence in the urine with these diseases, especially if the other signs of abnormal intestinal fermentation are present, must be accepted as a sign that the exciting cause arises in the gastrointestinal tract.

DISEASES OF THE UVEA.

The extreme difficulty of finding a satisfying cause for various types of uveitis, that is to say, uveitis with punctate keratitis, iridocyclitis, iridochoroiditis, recurring plastic choroiditis, and so-called relapsing or recurrent iritis, has led in recent times to a search for some toxin other than that supplied by syphilis and in vague terms by the rheumatic or lithemic diathesis.

According to Elschnig, what may be termed the gastrointestinal factor bears an important relation to these uveal tract diseases, and should be regarded in many of them, if not the sole, at least a contributing cause. Two varieties are in his experience particularly to be classified here.

1. Chronic iridocyclitis with deposits in the anterior chamber and opacities in the vitreous which occurs in women whose breath has an acetone-like odor and who are the subjects of gastrointestinal indigestions and who tend to be obstinately constipated. It is not necessary to burden the communication with many case histories, but the type is a familiar one. An excellent example recently under my care occurred in a woman aged about 20, of sedentary habits owing to her occupation, who appeared with a moderate episcleral flush, which rapidly developed, as is so often the case, into a sharp uveitis, with mutton-fat drops deposited on the posterior surface of the cornea, succeeded rapidly by a web-like exudate in the anterior chamber and flake-like opacities in the vitreous. Ordinary remedies were entirely insufficient, but cure came with startling rapidity after thorough intestinal antisepsis preceded by the free administration of calomel and regulation of habits and diet. In this case scientific urine examination was not made, therefore the exact amounts of indican cannot be given. It is used simply as a type of those varieties to which Elschnig makes special reference and which all of us must frequently have seen.

2. Elschnig's second variety is relapsing or recurrent iritis. He believes the subjects are ordinarily healthy individuals. An attack of iridocyclitis occurs, is recovered from, and the process repeated until, if the inflammation is not checked, blindness is likely to result. In his experience the ordinary antisyphilitic remedies are useless, while treatment of the digestive organs arrested the process in five out of seven of his cases. He gives the case histories of seven patients, and for details the original article should be consulted.

Again, a very important series of phenomena, postoperative in character, should be considered from the same standpoint, namely, postoperative delirium and postoperative iridocyclitis. As is well known, postoperative insanity, particularly after cataract extraction, has been ascribed to the use of the bandage, the effect of atropin, to exaggeration of an imperfect mental balance existing prior to operation, and in a certain number of cases to autoinfection. The last etiologic factor has been especially the subject of discussion by Fromaget, who attributes the condition to an autotoxemia. Elschnig is satisfied that certain cases of iridocyclitis which follow operation may be caused by digestive disturbances, either reflexly or by the absorption of intestinal toxins.

He also believes that glaucoma following extraction may have a similar determining cause. In a remarkable case of this character recently under my care, on the morning of the sixth day, after a perfectly normal extraction without complications of any sort, pain began, followed rapidly by rise in intraocular tension, and, in short, an attack of glaucoma. In the preceding twenty-four hours the urine, which had been normal in quantity and which contained no albumin, although an occasional cast, fell to eighteen ounces, also there were stubborn constipation and other indications of gastrointestinal disturbance. With the relief of these symptoms and the restoration of the urine to the normal amount, associated with myotics locally, the entire attack subsided, to be repeated twice afterwards, in, however, much milder degree, again with a return of all of the symptoms, in so far as the urine and intestinal tract are concerned, which have just been described. The ultimate result was a brilliant cure, with a vision with correcting lenses of fully normal degree. It will at least be admitted that a gastrointestinal intoxication may have been responsible for this complication, although it is not proved. John Green, Jr.,[14] reports a case of juvenile glaucoma, preceded by optic neuritis which he thinks, with reason, may have been due to the resorption of noxious material from the intestinal canal.

Elschnig believes that many cases of chronic choroidal disease may be due to gastrointestinal intoxication, but is unwilling to state more than that this condition should be regarded as a probable cause. The relationship of this form of toxemia to plastic choroiditis will be dealt with to a certain extent by Dr. John T. Carpenter, in his paper on plastic choroiditis to be read at our present meeting, and therefore I will leave details to him. In common with many of my colleagues, I have felt that in many of these cases we must look for etiologic factors not gathered from the usual sources of syphilis, tuberculosis, scrofulosis, and the like, but from some toxin, and therefore from one that may be well attributed to enterogenous decomposition products. The important point, again, is the necessity of a search from this standpoint and the establishment of a dietetic and therapeutic regimen according to the conditions which have been found.

In so far as diseases of the lids are concerned, two important and troublesome affections should be mentioned, namely, recurring styes and various types of blepharitis. To styes Elschnig refers, and is satisfied that the discovery of indican in abnormal degree in these cases indicates their probable origin. The same is equally true of blepharitis. Modern dermatologists have recognized the important relationship of gastrointestinal toxemia to certain diseases of the skin, and many of their most brilliant results are not achieved through topical medication, but by vigorous antisepsis of the gastrointestinal canal.

In a recent conversation with Professor Duhring, one of America's most distinguished dermatologists, he impressed on me the absolute importance of investigation of the urine and treatment of the intestinal tract under these conditions, and urged me to make similar searches in the various chronic inflammatory conditions of the lid which we are so prone to encounter. We are only too often content with the corrections of refractive errors and the giving of some resolvent or stimulant salve, and while these are most important adjuncts in the treatment, they are not sufficient.

13. Groyer: Muench. med. Wochft., Sept. 26, 1905.

14. Green: Amer. Jour. of Ophth., vol. xxii, 1905, p. 318.

TREATMENT.

In so far as treatment is concerned, Elschnig believes that diet occupies an important position, and must be exclusively milk or mixed, according to circumstances. Calomel, in his experience, is a sovereign remedy, and he believes thoroughly in intestinal disinfection by the administration of guaiacol carbonate. Discussing this remedy with Dr. H. A. Hare, I find he also is satisfied that in many instances it furnishes him the best results in so far as intestinal antisepsis is concerned.

CONCLUDING REMARKS.

This communication is presented to the Section, not with the idea that it has in any sense reviewed the elaborate and conflicting literature of autointoxication, or that it has done anything more than to add to Elschnig's earnest advice that in the diseases already recited examinations should be made in accordance with the best methods of modern physiologic chemistry, that, in other words, we should not be satisfied with the ordinary routine, so-called alterative treatment, but that even so apparently simple a disease as scleritis, or certain types of recurring corneal ulceration, and particularly the various types of uveitis which have been described, should be the signal for patients to be submitted to an examination as thorough as modern clinical medicine can yield.

To summarize: Although we do not know the entity of a single autointoxication except the acidosis of diabetic coma, and although we know that no known autointoxication is to be attributed to any known end product of any known metabolism, to quote Alonzo Taylor, we do know, from clinical analogy, at least, that autointoxications exist, even if their true nature is as yet a secret. We do know, too, that after food is swallowed and before the end products of assimilation are eliminated, there may be processes arising under abnormal conditions which yield poisonous products foreign to normal metabolism, the reabsorption of which may be followed by definite symptoms. We have reason to believe, in the absence of other causes, that under these conditions ocular troubles may also arise largely in the corneoscleral and uveal tracts, and probably, in so far as the nervous apparatus is concerned, in manifestations to which we apply the term acute or chronic retrobulbar neuritis. We do not know whether these toxins, whatever they may be, actually are the only and sole cause of these conditions, but such examinations as have been made by Elschnig, by Kraus, by Groyer, by Edsall and by myself, at least indicate that, to use Elschnig's term, they may be considered accessory causes. As Edsall and I have said, they may be able to play a certain part in the production of the symptoms, and at times are probably the direct cause of their continuance, even when other more commonly accepted etiologic factors have ceased to be active.

[FOR THE DISCUSSION, SEE PAGE 543.]

The Tendency Toward Routine.—No matter what the early efforts of a physician may be, to give his patient the latest and best in the treatment of his disease, the final effect of the practice of medicine in the greatest number of instances resolves itself into the mere seeing of patients. He who permits himself to drift into a *status quo* never realizes the full measure of his possibilities, no matter what his ability or training.—James F. Percy, M.D., president of the Illinois State Medical Society.

VALUE OF TESTS FOR INVISIBLE HEMORRHAGE IN DIAGNOSIS AND TREATMENT OF DISEASES OF THE DIGESTIVE ORGANS.*

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Hemorrhage into the stomach and bowel may be divided into two groups, visible and invisible, which have in general the same significance and differ only in degree. Hemorrhage has always been considered an important sign in the diagnosis and treatment of diseases of the digestive tract, but until Boas,[1] in 1901, called attention to the value of chemical tests for blood the gastric contents and feces had been chiefly examined with the naked eye and the microscope.

The simple appearance is not a good guide, as Kuttner[2] was the first to point out, for a stomach contents may, if strongly acid, contain considerable blood without its being visible to the eye, the stools may be colored dark or reddish by food or drugs and be very deceptive; finally, very light colored stools may contain considerable blood coming from high up in the digestive tract. Microscopic examination is sufficient with large undigested hemorrhage, but will entirely overlook small but permanent and very significant bleeding.

Tests for invisible hemorrhage into the gastrointestinal tract have excited increasing interest in the last few years and have proved, in my opinion, to be the most valuable single method recently developed for the recognition of latent cases of cancer and ulcer and for separating them from neuroses and other benign affections of the stomach and bowel.

The value of the presence of blood as a sign of cancer or ulcer of the digestive tract depends on the care with which other sources of bleeding are excluded. The absence of blood has equal value in diagnosis as a means of ruling out well-developed cancer and the severe type of acute ulcer of the stomach and bowel. A large amount of valuable data bearing on this subject has been accumulated in the last few years by the combined efforts of Boas,[1] Kochmann,[3] Ewald,[4] Hartmann,[5] Joachim,[6] Clemm,[7] Schmilinsky,[8] Rossel,[9] Steele and Butt[10] and others. Boas[1] especially has written early and often on this subject, and it is due largely to his energy and enthusiasm that its importance has been recognized.

Since opinions differ somewhat as to the technic of the test and the value of the result, I present my own experience with 800 examinations of feces and a much smaller number of stomach contents in nearly 200 cases in the hope that it may contribute something to our knowledge of the subject.

Before giving my own results let me speak of the

* Read in the Section on Practice of Medicine of the American Medical Association at the Fifty-seventh Annual Session, June, 1906.

1. Boas: Deutsche med. Wochschr., 1901, No. 20; Deutsche med. Wochschr., 1903, No. 47; Volkmann klin. Vorträge, N. F., 1905, No. 387.
2. Kuttner: Berlin klin. Wochschr., 1895, No. 7; Ztschr. f. klin. Med., 1902, vol. xlv, p. 1.
3. Boas and Kochmann: Archiv. f. Verdauungskr., 1902, vol. viii, p. 53.
4. Ewald: Berlin klin. Wochschr., 1906, No. 9.
5. Hartmann: Archiv. f. Verdauungskr., 1904, vol. x, No. 1.
6. Joachim: Berlin klin. Wochschr., 1904, No. 18.
7. Clemm: Archiv. f. Verdauungskr., 1904, vol. x, p. 373.
8. Schmilinsky: Münch. med. Wochschr.: 1903, vol. xlvi, No. 49.
9. Rossel: Deutsche Archiv. f. klin. Med., 1903, vol. lxxvi.
10. Steele and Butt: Am. Jour. Med. Sci., 1905, N. S., No. 130, p. 36.

technic of the test and its modifications and the precautions necessary in using it. The necessity for a chemical test for hemorrhage is obvious when we recognize that the number of cases in which blood can be seen in gastric contents and feces is very small in comparison with the number which show it by the chemical test. Gastric contents with considerable decomposed blood may be clear and colorless and feces may have the yellow color of milk and yet contain much blood.

The methods which till recently have been used most by the clinician are Teichman's test for hemin crystals and the spectroscope. These require special skill or apparatus and have never been popular with the general practitioner. They must yield both in simplicity and delicacy to the recent guaiac and aloin tests which can easily be carried out by the practicing physician without other apparatus than a test-tube and a few simple drugs. Weber[11] introduced this method in its present form in 1893 as a modification of Van Deen's guaiac turpentine test. (Solutions of gum guaiac turn blue in the presence of blood on addition of old turpentine.)

A large number of substances in addition to blood gave this Van Deen reaction; food materials, such as green vegetables, milk, body fluids, such as bile, saliva, pus, and a number of drugs, such as iron and copper, iodin, and bromin salts, so the test in this form was not available as a test for blood. Weber's[11] modification consisted in making first an acetic acid-ether extract of the material to be examined and applying the above test to this extract. Weber discovered, and all later observers have confirmed the fact, that the above-named substances do not pass over into the extract, so that a blue coloration of the acetic acid-ether extract by guaiac and turpentine is significant of the presence of blood. Rossel[9] introduced later a similar test, using aloin in place of guaiac.

TECHNIC.

The technic of the test is as follows:

Ten c.c. of gastric contents or feces rubbed up with a little water, is shaken up with 3 c.c. of glacial acetic acid and then extracted in a test tube with an equal volume of ether, by gently shaking back and forth. The test tube is allowed to stand till a clear layer of ether separates; the latter is poured off and tested for blood by the addition of 10 drops of freshly prepared tincture of guaiac or aloin, and 30 drops of hydrogen peroxid, or well ozonized turpentine.

In the presence of blood the guaiac gives a clear blue color to the mixture and the aloin a clear cherry red. Either peroxid or turpentine may be used in the guaiac test. In the aloin test turpentine is better than peroxid.

PRECAUTIONS.

Several simple precautions are necessary for the success of the test. Use plenty of turpentine or peroxid if the extract is rich in fat. If little blood is present use more turpentine and less guaiac. The guaiac solutions are very variable. One will spoil in 4 to 5 hours; another will keep for a week. The only sure way is to make it fresh from the inner part of a solid lump of guaiac, never from the powder.

It is very necessary to add water to the ordinary solid stool before it is rubbed up with acetic acid, otherwise the ether-extract is mixed with the acetic acid and no true extraction occurs. Oxydases and vegetable stuffs are contained in the mixture and confuse the result. With water a true separation occurs, and only the hematin goes over into the ether-extract. Liquid stools need no addition of water.

11. Weber: Berlin klin. Wochschr., 1893, No. 19.

EMULSION.

To avoid emulsion of the contents and difficult separation of the ether, tip the test-tube slowly back and forth, so that the ether runs gently first to one end and then to the other; do not shake it up vigorously. If an emulsion should form it may often be destroyed by the addition of a few drops of alcohol, or a clear extract obtained by filtering after the addition of 2 or 3 extra c.c. of ether. This takes only one or two minutes. Use too much acetic acid rather than too little.

Rossel[9] and others have advised the previous extraction of fat with ether in order to avoid the formation of an emulsion; others have used separating funnels to obtain a clear extract. I have found the previous extraction of fat unnecessary except in a very few cases, and a simple test-tube provided with a rubber stopper which is always at hand is quite sufficient for thorough extraction and the production of a clear extract. The simpler the method and the less apparatus the better for the practitioner, provided the test is delicate and accurate. In some cases, however, when an excess of fat is present, its previous extraction undoubtedly breaks up the feces, renders the extraction of the blood pigment easier and thereby improves the delicacy of the test. Occasionally a small hand centrifuge, such as is commonly used to throw down a urinary sediment, is useful in rapidly clearing an extract, but even this is rarely necessary. Very watery stools separate slowly; it may be necessary to let the tubes stand for some hours.

DELICACY.

The test is a very delicate one. Either guaiac or aloin will give a positive test with approximately 1 part of blood in 10,000. A good positive test in the stools is obtained by 3 c.c. of blood ingested which show that little blood which is eaten raw or poured out in the upper digestive passage is absorbed, and that the examination of the stool will show a very small admixture from the stomach or small intestines. In general the aloin and guaiac tests are equally delicate, or nearly so, and the slight differences in the hands of different observers may well be due to slight individual differences of method, or differences in the samples of drugs used. My own experience using the best quality of Barbadoes aloes I could obtain and Merck's best turpentine well ozonized for several months was that the aloin test was slightly less delicate than the guaiac. Occasionally extracts would give a pale clear blue with guaiac when no aloin reaction was obtained.

COLOR.

The color reaction is usually clear, definite and easily recognized; occasionally, however, instead of a clear blue with guaiac or red with aloin, a shade of green reddish brown or brown appears. There has been considerable discussion whether these colors should be considered positive or negative.

Schmilinsky says these colors are due to faint traces of blood and that if only clear blue is called positive in the guaiac test some stools which contain blood will be missed. Boas,[1] Schloss,[12] Clemm[7] and Siegel[13] consider them negative because they may appear in feces free from blood, and Boas[1] states that the greatest dilution of normal blood which reacts with the guaiac test gives only a blue or violet color. This latter statement is true of blood in most stomach contents, but it certainly is

12. Schloss: Archiv. f. Verdauungskr., 1904, vol. x, p. 267.
13. Siegel: Münch. med. Wochsch., 1905, vol. lii, p. 1579.

not true of blood in stools, as any one can easily demonstrate by making this simple experiment:

If an acetic acid-ether extract containing blood is diluted gradually with ether, or with an ether-extract of bile-free gastric contents and tested with guaiac and turpentine, the blue color becomes paler and paler, but always remains "true blue" till it disappears, while if the same extract containing blood is diluted with an extract of normal blood-free feces, the clear blue color is lost in the weaker dilutions and is replaced successively by violet, greenish, red brown, and brown colors, showing that these other colors may be due to faint traces of blood in the presence of urobilin and other fecal pigments.

It is possible, however, that these colors do not always indicate faint traces of blood and for clinical purposes the way is plain. It is not necessary to utilize this test to its extreme chemical limits, since these limits are doubtful, but it is simplest and most practical to disregard the doubtful colors and consider the test positive only when the guaiac test gives a clear blue or violet and the aloin a clear red color. Iron, bismuth, chlorophyll, or an excess of urobilin may give the ether-extract a yellow, greenish, or red brown color, which somewhat obscures the color reaction; it is sometimes wiser to omit drugs and green vegetables at the time of the test, but this is by no means invariably necessary. Schmilinsky[8] has stated that the presence of HCl in stomach contents interferes with the delicacy of the test and advises neutralizing the contents before extraction. After long experience Boas says this is unnecessary.

OTHER HEMORRHAGES.

The greatest use of the test is in the diagnosis, prognosis and treatment of gastric ulcer and cancer, but the presence of invisible blood in the feces and gastric contents will only be of value when other small hemorrhages which have no significance are excluded, such as those from the mouth, nose, throat, lungs, hemorrhoids, fissure and the catamenia. The test shows the presence of blood, but does not indicate its source, which must be found in other ways.

Usually the insignificant sources of bleeding can be readily excluded, and it is worth while to take considerable trouble to do so if necessary. Examination of the anus and of the rectum with the protoscope may be necessary to exclude piles, polyp, fissure, etc. No stool should be examined which shows a streak of blood on the surface. We must always be careful in constipated persons to obtain a soft pasty stool which can not abrade the mucosa of the lower bowel and cause bleeding. In all such patients when the test was positive, a laxative was given and the test repeated several times with soft stools.

MEAT.

If a positive test for blood is to have clinical value, all meat and fish and their preparations must be excluded from the diet for two days before the test is made. There has been much difference of opinion as to the effect of diet containing rare cooked meat on the blood test in the feces. All agree that the feces may give a positive test after eating raw or rare meat, though this by no means invariably occurs. Many observers (Weber,[11] Schloss,[12] Boas,[1] Kochmann,[3] Rossel[9]) consider thoroughly cooked meat safe; others (Schmilinsky,[8] Hartman[5]) mistrust it and advise a meat-free diet.

My own experience is that a positive test in the stools is found frequently, but not invariably, after a diet containing rare meat or beef juice and may still appear, though very much more rarely after a diet of thoroughly cooked meat. The variation in the results of examination of the feces after eating meat evidently depends largely on the degree of digestion of the meat. In some patients with good digestion it may be simpler to make the test first, without change of diet (not excluding meat). If a negative result is obtained, it is just as valuable as if meat had been excluded. If a positive result is obtained, meat must be forbidden. I found it practically better to exclude all meat for a few days, particularly with ambulatory patients over whose diet I had less absolute control, otherwise a positive result only made me suspicious of the degree of cooking of the meat eaten. When the stools to be examined come from a patient who is being fed by rectum, we must be sure that no meat extract is used in the nutrient enemata.

MATERIAL FOR EXAMINATION.

Hemorrhages into the stomach are the most frequent and important of those we are dealing with, and the question is important which material, stomach contents or feces, gives us the most reliable evidence of invisible gastric hemorrhage. It seems natural to conclude that the stomach contents will be the best because then all other sources of bleeding into the bowel are excluded.

It is unfortunate, however, that the use of the stomach tube is a very frequent artificial cause for the presence of minute traces of blood in the gastric contents. This blood may be either visible or invisible, frequently the latter, and it may be difficult or impossible to distinguish these slight traces of blood due to rubbing the mucosa from small spontaneous hemorrhages into the stomach. If the test is made frequently in all classes of cases, one is astonished to find how frequently a positive test is obtained in clear stomach residue which showed no gross evidence of blood. It has been claimed that fresh blood due to the tube can be distinguished from older bleeding; this is true no doubt if a fresh red streak is seen, but in many cases it is entirely impossible. If any one doubts this, let him make the following experiment: Add a drop of blood to 50 c.c. of water or very dilute HCl and see how rapidly it is decolorized and how strong a guaiac test it gives. In some conditions, namely, organic diseases of the stomach associated with anacidity, such as chronic catarrh, achylia and atrophy, the mucous membrane is very easily wounded, and, while spontaneous bleeding is absent, this slight artificial bleeding is easily produced and is very confusing. In examining the stomach contents in these cases, which are just the ones it is most necessary to distinguish from cancer, we may frequently get a positive blood test. In other conditions, such as normal stomachs, or those with a large amount of contents, easily aspirated, it rarely occurs.

A chemical examination of the stomach contents for blood in 50 consecutive cases in which there was no reason to expect spontaneous bleeding into the stomach, in which the stomach contents showed no sign of visible blood and in which the examination of the stools was invariably negative, gave the following results:

Functional diseases:	Cases.	Positive.	Negative.
Hyperacidity, subacidity, hyperesthesia, etc.	43	11	32
Achylia gastrica	4	2	2
Chronic gastric catarrh	3	2	1
Total	50	15	35

A comparison of this large number of positive results in the stomach contents in these benign cases with the uniformly negative results in the stools, shows at a glance which method is most useful in distinguishing these cases from cancer or ulcer.

Let me cite a few other figures in this connection. Schloss examined 187 feces from 20 cases of anacid catarrh and achylia and found 185 negatives. Boas and Kochmann[3] found the feces in 40 such cases negative and 2 positive. Hartmann[5] found 35 feces negative.

The examination of the stomach contents for blood has certain advantages over the examination of the feces; it is simpler, pleasanter, no excess of fat is present and no fecal pigments to obscure our color reaction, and we are not confused by other sources of blood below the stomach, but these advantages are vastly outweighed in my opinion by the risk of misleading results from minute artificial hemorrhages due to the use of the stomach tube.

Negative results in stomach contents have much value on the contrary as a means of ruling out cancer of the stomach, though they cannot be absolutely relied on for that purpose. It may rarely happen that no blood is found in the gastric contents in cases of gastric cancer, even when it is constantly present in the feces. Strauss attempts to explain this paradox by active gastric motility which passes the blood rapidly on to the bowel and Boas by the vertical position of the stomach, in which case the blood has a greater tendency to flow toward the duodenum than the fundus, especially if the cancer is near the pylorus. In ulcer this combination of signs may be due to the fact that by the time blood appears in the feces it may have all left the stomach and no new bleeding have occurred.

Boas[1] and almost all later observers have advised examination of the feces in preference to stomach contents for the purpose of diagnosis because no artificial method is necessary to obtain the material for examination. Even in constipated persons all mechanical scraping of the mucous membrane and subsequent bleeding can be easily avoided by the use of a laxative.

In the investigation of my cases, I have used the feces almost entirely for the reasons just given and because in following the results of treatment of ulcer, stools may easily be obtained at frequent intervals when the use of the stomach tube is contraindicated. In general no stools were examined for blood within two days of the passage of a stomach tube. I believe that when proper precautions are used both positive and negative results in the stools have a greater value than the same in stomach contents.

Recently, in a few cases I have used the benzidin test introduced by O. and R. Adler,[14] which differs from those described above in using a concentrated alcoholic solution of benzidin in place of guaiac or aloin, and gives a clear green color in the presence of blood. This is decidedly more delicate than the guaiac test, giving a positive reaction with 1 part of blood in 200,000. Boas,[1] Ewald[4] and Schumm[15] agree that the reagent is too delicate for clinical use. We have a close analogy with tests for lactic acid in the stomach; if we introduce too fine a test, we get very frequent positive results which have no value from a clinical standpoint.

Boas[16] has just described a new reagent for finding invisible blood in feces and stomach contents which I have not had opportunity to test thoroughly. This is a 1/200 solution of chlorhydrate of phenyldiamin. This is used in place of the tincture of guaiac or aloin of the older tests and gives a very characteristic olive green color in the presence of blood. This reagent apparently has no special advantage over the older ones except the property of keeping well, but is equally delicate and has value as a means of confirming their results in a doubtful case.

14. Adler, O. and A.: Ztschr. f. physiol. Chemie, 1901, xli, p. 59.
15. Schumm: "Die Untersuchung der Fäzes auf Blut," Jena, 1906.
16. Boas: Centrbl. f. inn. Med., 1906, No. 24.

CLINICAL SIGNIFICANCE IN GENERAL.

A positive test has great value as a danger signal, a sign of disease, but the discovery of invisible bleeding does not constitute a diagnosis. This is made only by considering this sign in conjunction with the other signs and symptoms of the case. The appearance of the test, either temporary or permanent, its recurrence and its disappearance are all significant. Its absence has somewhat less value in diagnosis, in my opinion, than its presence, for in rare cases invisible hemorrhage has not been found where it would be looked for (cancer, ulcer), though in other cases it has occurred unexpectedly, (rectal polyp, etc.); both its absence and its presence have great value in spite of rare exceptions. It has great value in prognosis, and may be useful as a premonitory sign of profuse hemorrhage. No ulcerative process in the digestive tract can be regarded as healed while there is evidence of continued bleeding. The persistence of invisible blood for a short time after a profuse hemorrhage is not especially significant, but invisible bleeding of long duration and large amount is a bad omen and should lead always to a guarded prognosis in spite of an otherwise favorable outlook. On the other hand, continued absence of blood from the stools is a favorable sign. This is well illustrated by 3 cases which Boas[1] reports of severe sudden hematemesis in old people (senile gastric hemorrhage associated with arteriosclerosis) in which the first thought was of malignant disease. A long continued examination of the stools, however, gave a persistently negative result and the diagnosis of cancer was given up. All three patients entirely recovered.

The test is valuable in prophylaxis. There is no need to dwell on the necessity of recognizing losses of blood, which though small in amount may become serious and important if long continued. It is just as important to recognize and try to check a small, but constant invisible bleeding, as a more profuse acute hemorrhage, and the earlier the condition is recognized the better. While we unfortunately can do little or nothing to check the minute hemorrhages due to cancer of the digestive tract, in benign conditions we can do much.

The test is very useful as a measure of the results of treatment. The value of rest in bed and a liquid diet in the treatment of continued hemorrhage is emphasized by the results of this test, which show that invisible bleeding in acute ulcer as a rule entirely ceases after four or five days of this treatment. The test may be used as a measure of the effect of bismuth, gelatin or other substances upon hemorrhage, as Schloss[12] has already done with bismuth in gastric ulcer, and Boas with hot poultices in the same diseases.

Our ideas about the frequency of hemorrhage are changed by using the blood test; for example, Leube, Rosenheim and Riegel[17] state that hemorrhage occurs in about one-half the cases of cancer. The fact is new that slight continuous hemorrhages in cancer are the rule.

CLINICAL RESULTS.

I will now take up the divisions of the alimentary canal, one after another and give my own findings.

17. Riegel: "Diseases of the Stomach," Nothnagel's Encyclopedia.

ESOPHAGUS.

I have not had an opportunity to study the reaction in esophageal cases. Boas[1] has shown that the test is of value in doubtful cases of cancer; here, as in other parts of the digestive canal, the constant presence of blood favors this diagnosis. Spasm, and diverticulum, and benign stricture have given negative results. The conditions of the test here are less clear than in diseases of the stomach, however.

STOMACH.

Following Boas'[1] example we divide our stomach affections into three classes; those in which no bleeding occurred, those with temporary, and those with permanent bleeding.

I. *No Bleeding.*—In this class of stomach diseases in which the test was always negative are 89 cases consisting of

	Cases.	Stools examined.
Normal stomach	10	30
Functional disease:		
Subacidity	17	57
Achylia	6	22
Hyperacidity	22	67
Other neuroses	28	70
Chronic gastric catarrh	6	27
	89	253

In every case the examination of the stools gave invariably negative results when the proper precautions of the test were observed; occasionally a relapse from vegetarianism or marked constipation with abrasion of the rectum or piles gave a fugitive positive result, but when these disturbing factors were excluded, uniform negative results were obtained. These results accord with those of other men. The only disease in this group about which there has been any difference of opinion is achylia gastrica. Kuttner[2] found positive results with the test in several cases in which this diagnosis was made. Boas,[1] Kochmann,[3] Schmilinsky,[8] Hartmann[5] and Schloss,[12] however, found invariably negative results in achylia, with which my cases agree. Kuttner's[2] opinion seems to be overruled by weight of evidence. The absence of a positive test in achylia is valuable in the differential diagnosis from cancer in which positive results are the rule. The great similarity between cancer and achylia gastrica in middle aged and elderly persons, when the latter is accompanied by loss of flesh and strength and some anemia, makes any new aid in diagnosis most welcome.

I shall speak more fully in connection with my cases of cancer of the value of the test in the differential diagnosis of cancer from the benign anacid cases which most resemble it.

With the exception of acute gastritis of the severest type and one or two extremely rare diseases (such as polyposis of the stomach) we have only three conditions of the stomach to consider in connection with positive blood tests, namely, ulcer, cancer or cancerous ulcer, and benign stenosis of the pylorus.

II. *Temporary Bleeding.*—This class includes cases of ulcer and benign stenosis and one case of severe acute gastritis. In 4 cases of acute gastritis thirteen stools were negative, and in one severe case eight stools were negative, and three intermittent positive results were found at a time of violent persistent vomiting and retching.

Gastric and Duodenal Ulcers: In 33 cases in which the diagnosis of gastric or duodenal ulcer has been made, 202 stools were examined. Twenty-seven were cases of undoubted ulcer, but in 6 cases the diagnosis was doubtful; they were either mild cases of ulcer or gastric neuroses which closely resembled it. In one-half the 33 cases, both positive and negative results were obtained, and in the other half only negative results were found. The latter was made up almost entirely of cases of previous undoubted ulcer in which it was a question of recurrence, and of mild ulcer or neuroses resembling ulcer. The results of blood tests were very variable and intermittent and much affected by the kind of ulcer, whether acute or chronic, the kind of diet and the degree of rest.

The ulcer cases may be divided into two groups which differ greatly with respect to bleeding, the acute cases in which visible and invisible blood is frequent and abundant, and the chronic indurated ulcers, which often give a negative blood test; and in which positive results may be obtained only once a week or at much longer intervals. In these cases especially we must never be content with a single examination.

Of 14 cases of acute ulcer 12 gave positive results. In these acute cases treated by rest in bed, rectal feeding and absolute rest of the stomach for five to seven days, the last trace of invisible blood usually disappeared from the stools in four to six days. In one case the blood persisted for ten days entirely without symptoms and in 2 cases intermittently for nearly a month. It is noteworthy that not even a trace of blood was found in the feces in two obvious acute cases of ulcer during the height of the attack. I will cite 3 cases to illustrate the course of invisible bleeding in acute ulcer under the above treatment.

CASE 1.—Female, aged 38, had nausea, much vomiting, dark brown vomitus and tarry stools twice in last month. No pain. Hgn., 60 per cent.

Occult Blood.

February 14, positive.	February 20, negative.
February 15, positive.	February 22, negative.
February 16, positive.	February 24, negative.
February 18, positive.	March 3, negative.

CASE 2.—Female, aged 53, had recurrent ulcer, hematemesis 5 years ago, prompt recovery, no symptoms till vomiting of blood yesterday, no pain, no tenderness. Hgn., 50 per cent.

Occult Blood.

January 19, intense.	January 25, negative.
January 20, positive.	January 26, negative.
January 22, positive.	January 27, negative.
January 23, positive.	January 30, negative.

CASE 3.—Female, aged 24, had epigastric pain and tenderness 3 months, vomiting 1 hour after meals, blood in vomitus 3 days ago. Hgn., 65 per cent.

Occult Blood.

March 31, intense.	April 11, negative.
April 2, positive.	April 12, negative.
April 3, positive.	April 13, positive.
April 4, negative.	April 14, positive.
April 5, negative.	April 16, negative.
April 6, negative.	April 17, negative.
April 7, positive.	April 18, negative.
April 9, positive.	April 20, negative.
April 10, negative.	April 23, negative.

On April 7 and 13 epigastric pain and tenderness appeared with the blood; all disappeared promptly on limiting the diet. Here the examination of the feces was a valuable aid in treating the case.

The test is of much value in helping us to distinguish a gastric ulcer, or at least an ulcer which requires strict treatment, from a neurosis. Here a positive result has the same significance as a visible hemorrhage. By this test it is impossible to distinguish an ulcer from so-called erosions or other causes of minute or capillary bleeding into the stomach.

A positive result has greater value in diagnosis than a negative, for we must of course remember that a negative test does not rule out ulcer in a case in which the

other signs and symptoms point strongly to this diagnosis. This is especially true of the chronic indurated ulcers in which bleeding may occur only at long intervals. My own high per cent. of positive results in acute ulcer (12 in 14, or 86 per cent.) is probably due to the severe type of ward cases examined. The chief use of a negative test here is in helping us to decide how a doubtful ulcer case should be treated. Those which give constant negative results certainly need less thorough protective therapy. Since occasionally blood is found only in the feces and not in the gastric contents in ulcer (and cancer) of the stomach, this finding can not be used as a sign of duodenal ulcer. Fortunately the differential diagnosis of gastric and duodenal ulcer has little practical value.

Stools were examined in 13 cases of chronic ulcer, including cases in which the recurrence of an ulcer was suspected. All these patients had had one or more recurrent attacks of epigastric pain and hematemesis at considerable intervals, extending over a period of from two to four years. Eight of them came under my observation at a time when there was a return of epigastric pain, hyperacidity or vomiting, but no visible hemorrhage, in order to decide the question whether any trace of bleeding had again occurred, or was threatened. The blood test proved most useful in deciding this question. Uniformly negative results were obtained and the treatment based on this finding proved satisfactory. In 4 cases of chronic ulcer intermittent positive results were found and were of great interest in diagnosis, prognosis and treatment. In three of these cases cancer had been suspected by experienced physicians, but the examination of the stools served to put us on the right track and our diagnosis of chronic ulcer was in each case confirmed by operation or autopsy. In one case of chronic gastric ulcer only negative results were obtained. The case is worth quoting:

CASE 4.—Male, aged 36, had epigastric pain and vomiting intermittently for three years; hematemesis one year ago. For two months there was severe pain and much vomiting; no visible blood. Gastric contents after test meal, 50 c.c., free HCl, 27, total acidity, 60, no blood. Stools examined twice, no blood. At operation a large chronic indurated gastric ulcer was found.

This case shows that old hard gastric ulcers may occasionally exhibit no trace of blood in gastric contents or feces, and emphasizes the need for repeated examinations if such a condition is suspected. One or two negative results can not be used in diagnosis to exclude chronic ulcer. On the other hand, the guaiac test is occasionally of value in picking up a latent chronic ulcer without symptoms save anemia and invisible hemorrhage of long duration. Hartmann reports seven such cases, which he discovered by this method, chronic ulcers without hematemesis with days and weeks of bleeding without symptoms. I agree with Hartmann[5] that the diagnosis of chronic gastric ulcer from gastric cancer by examination of the stools for blood is usually easy. In all well developed gastric cancers which I have seen every stool examined has given a uniform strong positive test even when the examinations have extended over several months. This uniformity and persistency of invisible bleeding over long intervals has not been present in a single case of chronic ulcer which I have seen. Intermittency of bleeding is the characteristic of gastric ulcer. The positive test is very variable from barely recognizable blue to deep blue black, then absent for a time, then recurring, etc. I have seen several cases, of which the following is an example, in which the diagnosis of cancer had been made, and examination of the stools for blood was of great help in correcting the diagnosis.

CASE 5.—Female, aged 40, epigastric pain and frequent vomiting of small amount for 6 months, loss of 40 pounds weight. "Coffee ground" vomit several times. Vomitus free HCl, 0; total acidity, 16; guaiac positive. Stomach tube not used. Rectal feeding and liquids.

Occult Blood.

January	27, positive.	February	11, negative.
January	28, positive.	February	13, positive.
January	29, positive.	February	15, positive.
January	30, positive.	February	18, negative
January	31, negative.	February	21, negative.
February	8, negative.	February	24, negative.

At operation, February 26, a small chronic ulcer was found on the posterior wall of the stomach.

Persistent bleeding on a strict diet in older people with a history of chronic ulcer has been said to indicate the development of a cancer on the ulcer base. This seems natural and logical and is probably true if by "persistent" we mean uniform invisible bleeding which continues under observation for four or five weeks. On the other hand, we must not be misled into assuming the presence or development of a cancer, if we find invisible blood constantly present in the stools for ten or fifteen days after a considerable hemorrhage.

In acute ulcer, if the patient is put to bed and fed exclusively by rectum, the last trace of invisible bleeding stops as a rule at the end of four to six days. Exceptional cases of ulcer occur in which the invisible bleeding may last considerably longer. Two cases in my series may be mentioned here; in the first, the development of a cancer was suspected, and in the second the diagnosis of gastric cancer on an ulcer base was made. The diagnosis in both cases was corrected by a careful routine examination of the stools and the gradual disappearance of blood excluded cancer.

CASE 6.—Gastric ulcer. Male, aged 38. Mother died of gastric cancer. Patient had had no previous illness except acute appendicitis three years before. For one month he had suffered epigastric pain between meals. Rapid loss of 20 pounds. He did not vomit till day of entrance, when he vomited one pint of "coffee grounds" material. Test breakfast was not given.

Treatment: Rest in bed, exclusive rectal feeding first week, liquids by mouth next four weeks. Stools, guaiac test uniformly positive for twelve days after the visible hemorrhage, then persistently negative. Patient was given dietary after treatment of ulcer. At end of five months had gained 18 pounds, and considered himself perfectly well.

CASE 7.—Chronic gastric ulcer. Male, aged 46. For two years he had had distress or pain two or three hours after meals, occasional vomiting, gradual loss of weight. In last three weeks there was much epigastric pain, frequent vomiting of small amounts of "coffee ground" material. Pale, emaciated, very weak, rapid recent loss of weight, 25 pounds in all. Hgn., 65 per cent., reds 3,000,000. Gastric contents after test meal, 150 c.c., free HCl 63, total acidity 90, guaiac positive. Treatment same as in Case 6.

Occult Blood.

November	20, positive.	December	8, negative.
November	26, positive.	December	12, negative.
November	28, positive.	December	13, positive.
November	29, positive.	December	15, negative.
November	30, negative.	December	17, negative.
December	1, positive.	December	19, negative.
December	3, positive.	December	23, negative, and negative thereafter.

Dietary after treatment of ulcer given. Patient seen six months later, had gained 20 pounds, had felt perfectly well, and worked steadily for four months. Gastric contents normal.

In the diagnosis of chronic ulcer from cancer or benign stenosis of the pylorus, oftentimes the usual

methods of examination are sufficient and the evidence obtained from tests for invisible blood is only confirmatory.

Perhaps the greatest value of the test in gastric ulcer is in treatment.

1. In prophylaxis, using the test as a premonitory sign, it warns us that we must treat the small early hemorrhages with great care in order to avoid larger ones. I feel sure that the test may be occasionally useful in this way, though I can say little from my own experience, because relatively few of these cases were seen in consultation or in the hospital wards until after some visible bleeding had occurred. One case of gastric ulcer, however, showed occult blood in the stools, and as a result of prompt treatment (I believe) cleared up without ever showing any visible blood. Several cases of chronic ulcer were seen in which occult bleeding was followed in a few days by a severe hemorrhage.

2. It is a good measure of the results obtained by treatment, a measure of the effect of the diet on the patient. We can determine when food is well borne, when it can be increased and the effect of the increase. Our dietary treatment, especially of gastric ulcer, has been placed on a much more satisfactory basis as a result of examinations for invisible blood. Our estimate of the results of treatment in healing the ulcer need not be based on the subjective symptoms of nervous young women, but on a definite objective sign. By the use of the test we obtain an idea of the course of the disease impossible to get in other ways.

Repeated recurrence of the bleeding when the diet is increased may be taken to mean a lack of proper healing and suggests a chronic ulcer and a need for surgical interference. The test may be used as a measure of the effect of drugs on the hemorrhage as Schloss[12] has done with reference to bismuth in gastric ulcer.

3. It is of use in determining prognosis. As long as occult hemorrhage persists, the patient can not be looked on as out of danger and must be kept under observation.

This is well illustrated by the two following cases:

CASE 8.—Duodenal ulcer. Female, aged 24, had been previously well. First symptom was the passage of a quart of clots and dark bloody fluid from bowel, no pain, much vomiting, not containing blood.

Treatment: Rest in bed, rectal feeding. Patient rallied rapidly from hemorrhage, the general condition promised a speedy recovery, and the stools soon became normal in appearance; they continued, however, to give a strong positive test for invisible blood for ten days. On the eleventh day a fatal hemorrhage occurred.

The next case was under observation for several months. The intermittent bleeding is typical of chronic ulcer. Twice the appearance of invisible bleeding was followed in a short time by gross hemorrhages.

CASE 9.—Chronic duodenal ulcer. Female, aged 43, had had five previous attacks of epigastric pain and melena at intervals of two to six months, beginning three years ago. One year ago had had gastric-enterostomy and entero-enterostomy, then was well for eight months. In last two months pain recurred, with frequent vomiting, free from blood, and small clots in feces.

Treatment: Rest in bed and rectal feeding during hemorrhages, liquids by mouth in intervals.

Occult Blood.

January 1, positive.	March 5, positive.
January 3, positive.	March 7, positive.*
January 7 to 25, 6 tests negative.	March 10, positive.
January 31, positive.	March 12 to 24, 4 tests negative.
February 1, positive.	April 2, positive.*
February 2, positive*	April 3, positive.
February 5, positive.	April 5, positive.
February 9 to March 2, 5 tests negative.	April 6 to 25, 11 tests negative.

* Gross hemorrhage.

Before leaving the subject of gastric ulcer, let me give a warning from practical experience in the examination of stools. In several cases of acute ulcer on finding blood in the stools two or three weeks after treatment has been begun, I was misled into thinking that the course of healing of the ulcer had been interrupted and fresh bleeding had occurred, and all food by mouth was stopped, etc. On careful examination I found that the only stools which contained blood were those which followed the giving of a daily cleansing enema by means of a rectal tube. Other stools not preceded by the passage of a rectal tube showed no blood. I therefore concluded that the presence of blood in these instances was artificial, not a sign of latent gastric hemorrhage, but due to the rubbing of the rectal tube over the mucosa of the rectum, which had become slightly inflamed or irritated by a long course of nutrient enemata. We have here an analogy to the minute artificial hemorrhages into the stomach which may follow the passage of a stomach tube in chronic gastric catarrh and allied conditions. All confusion with artificial hemorrhages in such cases may be easily avoided by not using any stool for examination for occult blood which has been preceded by the passage of a rectal tube.

Benign Stenosis of the Pylorus: This affection belongs to the class of cases which may show temporary bleeding. We have examined 5 cases in all of which the stenosis was secondary to gastric ulcer, and caused by cicatricial contractions or adhesions about the pylorus. Three were severe cases, with copious vomiting, hypersecretion, stomachs whose lower margin was 3 or 4 inches below the navel, and a morning fasting stomach residue of 400 to 1,500 c.c. Two were cases of moderate grade. We have examined 22 stools and 11 stomach contents in these 5 cases, and obtained only two positive results in both feces and stomach contents, in one of the severe cases. This case improved much on treatment and the blood promptly disappeared.

These cases and others which have been reported indicate that in the milder grades of benign pyloric stenosis when there is no stasis of food in the stomach, the gastric contents and stools give a negative result; in severe cases with stasis an occasional positive result may be found, which readily disappears as the result of lessening the stasis by proper treatment, and finally that even high grade stasis may cause no trace of bleeding. It is easier to be sure of these facts than to explain them. The positive result may occasionally be due to meat residue which has remained a long time in the stomach, but this source of blood can be easily avoided. In other cases, Boas[1] suggests that it may be due to small erosions or capillary hemorrhages resulting from stasis and irritation of the mucosa, and the disappearance of the blood is probably due to the healing of these erosions, and the reappearance of blood to their recurrence under the influence of marked stasis and excess of HCl.

The entire absence of blood or a changeable result with long periods of absence are characteristics of benign stenosis. These facts are of great value in distinguishing it from malignant stenosis of the pylorus.

III. *Permanent Bleeding.*—In this class we practically have only cancer to consider among chronic affections.

Cancer of the Stomach: I examined seventy-seven stools in 12 cases of cancer of the stomach; all the stools examined (namely, fifty-eight) in 10 cases were positive. In 2 cases in which operation was refused, nine earlier

stools were negative and all the stools, ten in number, at a later period were positive. In one case this change undoubtedly coincided with the change from the pre-ulcerative to the ulcerative stage of cancer, and in the other with the development of a cancer on an ulcer base. These cases are quoted.

CASE 10.—Cancer of pylorus. Male, aged 47. Nov. 1, 1905, two months epigastric distress, loss of appetite, careless in diet, loss of 25 pounds in one and one-half months, no vomiting. Fasting stomach contents, 70 c.c., with microscopic food remains, no blood, lactic acid present. Contents after test meal, 80 c.c., free HCl 0, total acidity 4. General condition fair. Nothing abnormal found on abdominal examination.

November 15: Considerable vomiting, losing ground. Stomach contents same. Exploratory operation advised, but refused.

January, 1906: On careful diet and hygiene much improved, gained 7 pounds; no distress or vomiting.

May, 1906: Has lost 22 pounds in last four months. Marked pyloric obstruction, anemia, cachexia, palpable pyloric tumor and large liver.

Occult Blood.

November 1, negative.	January 3, positive.
November 5, negative.	January 17, positive.
November 7, negative.	February 24, positive.
November 14, negative.	May 2, positive.

CASE 11.—Gastric ulcer, benign pyloric obstruction, gastric cancer. Female, aged 63.

June, 1905: Last year patient had several severe attacks of epigastric distress and pain two hours after meals, with vomiting. No blood passed or vomited. General condition excellent.

October, 1905: Marked pyloric obstruction had developed, frequent distress and copious vomiting of old food. There was moderate loss of weight. Fasting stomach contents 650 to 800 c.c., three layers, free HCl 24, total acidity 86, sarcinæ, no blood. Lower border of stomach 3½ inches below navel.

January, 1906: Much improved on lavage and diet; distress and vomiting disappeared.

May, 1906: Patient had failed rapidly in last three months, lost 30 pounds, marked anorexia, persistent pain in stomach, vomiting of small amounts, weak and cachectic, epigastric tumor. Lavage continued, very little residue in fasting stomach. Contents after test meal, 90 c.c., free HCl 0, total acidity 13, no lactic acid, blood present.

Occult Blood.

October 15, negative.	May 25, positive.
November 9, negative.	May 30, positive.
November 15, negative.	June 4, positive.
January 5, negative.	June 9, positive.
January 18, negative.	June 20, positive.
May 20, positive.	

The diagnosis in this case is not absolutely certain, but the early history suggestive of ulcer, followed by secondary ectasy with little change in weight and condition, and finally the rapid growth of a tumor and cachexia with marked loss of weight and the accompanying change from hyperacidity to anacidity could hardly be more typical of the diagnosis given.

The high per cent. of positive results in cancer agrees with the findings of other men. Boas[1] in 124 cases of gastric cancer, including both early and late cases, found 107 positive. Joachim[6] in 18 cases found 17 positive, and Hartmann[5] in 17 cases, 14 positive. The few negative results in cancer of the stomach are probably due to the fact that the cases were examined when the cancer was in an early pre-ulcerative stage, or that the cancer was of the much less common scirrhus type which develops slowly and does not ulcerate or ulcerates only in its latest stage.

The test is of much value in the diagnosis of cancer; no other condition shows so much blood except acute hemorrhage, and the persistence and permanence of the bleeding is in strong contrast to non-cancerous diseases. The test is most important in the diagnosis of cancer from chronic anacid gastritis, achylia gastrica and pernicious anemia. Its permanent absence speaks against cancer. In the diagnosis of cancer from ulcer, rectal feeding or a liquid diet may be of great value. It usually stops the bleeding of ulcer, but has little effect on cancer.

The test is interesting in cases with stasis, free HCl in abundance, yeast and sarcinæ and no palpable tumor, a group of symptoms which occasionally occurs in cancer, but is much more common in benign stenosis. We have already mentioned the fact that in the latter condition occult blood may occur. The constant presence of blood in the feces when the stasis has been much relieved by treatment is strong evidence in favor of cancer, and the permanent absence of blood in such a case is strong evidence against cancer.

The test is unfortunately not valuable in the early diagnosis of cancer, as cases 10 and 11, already quoted, clearly show. Occult blood is not an early sign, it appears only in ulcerated cases, but as Boas[1] says, the difficulties of early diagnosis lie not so much in our inability to make it as in the latency of the symptoms which bring the patient to us in an advanced stage. It is not fair, however, to say that the reaction appears only when other signs are unmistakable. In my experience the blood examination has repeatedly proved valuable in the diagnosis of latent cancer without tumor and without stasis of food, or in excluding cancer in cases in which the palpable tumor was of doubtful origin (perigastritis, chronic ulcer, etc.). Of 10 cases (forty-eight stools examined) in which the clinical picture closely resembled cancer of the digestive tract and in which the blood test was negative, all were proved not to be cancer by operation or autopsy or subsequent history. Of the 8 cases resembling gastric cancer, 4 proved to be pernicious anemia, 2 chronic gastric catarrh, 1 simple achylia gastrica and 1 tuberculosis. Of the 2 cases resembling intestinal cancer, 1 proved to be chronic appendicitis and 1 tuberculous peritonitis. In many of these cases the resemblance to cancer was very close and the blood test of great diagnostic value.

BOWEL.

In diseases of the bowels there is much less to be said. Duodenal ulcer has been considered with gastric ulcer; no cases of typhoid are included in my series, which is chiefly composed of chronic diseases of the digestive tract.

In 23 cases eighty stools were examined. In 16 cases comprising mucous colic, chronic catarrh, neuroses, ascariasis, chronic appendicitis, all stools (forty-nine in number) were negative. Stools in 2 out of 3 cases of tuberculous ulceration of the bowel were negative, 1 case gave seven intermittent positive and five negative results. In one case of tropical dysentery two early stools were positive and four later ones negative. These intermittent positive results in ulcerative diseases of the bowel have some importance because simple catarrh and positive congestion usually give negative results. In diseases of the colon, blood is often found without the use of these tests.

In cancer of the bowel the test has some value, but curiously enough positive results are decidedly less constant and frequent than in cancer of the stomach. I have examined nine stools in 3 cases. Two, cancer of the sigmoid, gave always a positive result. One, a large ulcerative cancer of the cecum, in which unfortunately I was able to examine only one stool, gave a negative result. This shows the need of repeated examinations in a suspected case. Boas[1] cites 3 cases of cancer of the bowel. One case gave always positive results, the other

two gave only one positive result each; at all other times negative. A case cited by Hartmann[5] showing the value of the blood test in the early diagnosis of cancer of the colon is worth remembering. The patient's only symptom at first was mild diffuse pains. He gained weight under treatment. The blood test, however, was always positive. He refused operation and "felt well." Three months later he returned; the blood test was still positive, and laparotomy showed an inoperable cancer of the sigmoid.

My cases of intestinal cancer and the recorded cases which I have found are too few for conclusions, but I should expect a positive result to be a great help in the diagnosis of cases without palpable tumor. A negative test has apparently only a limited value in ruling out cancer of the bowel in conditions which simulate it, such as chronic appendicitis or tuberculous peritonitis. In cancer of the rectum blood is usually visible.

LIVER.

In 18 cases of hepatic disease sixty-one stools were examined. In 7 out of 9 cases of cirrhosis all stools, twenty-four, were negative, in 1 case all three stools were positive, in 1 case four were positive and four negative. The bleeding has no diagnostic value and is likely to lead occasionally to error in diagnosis because cirrhosis often exists with indefinite digestive symptoms. In 5 cases of gallstones all stools, thirteen, were negative. The blood test ought to help occasionally in the diagnosis between gallstones and gastric ulcer. Joachim[6] and Clemm[7] state that cancer of the liver always shows blood. This is not true. If the hepatic disease is secondary to cancer of the stomach or bowel, the positive results are easy to understand. On the other hand, six stools in 2 cases of extensive cancer of the liver secondary to cancer of the breast gave only negative results.

PANCREAS.

I have had no opportunity to use the blood test in diseases of the pancreas. Reported results are too few and contradictory to base an opinion on. I see no reason for expecting this test to be of value in the diagnosis of pancreatic disease.

PERNICIOUS ANEMIA.

The most important group of cases examined of disease outside the digestive tract were 11 patients with pernicious anemia. Forty-five stools were examined with an invariably negative result. This constant absence of blood is very valuable in the diagnosis of these cases from cancer of the digestive organs. It also agrees with our present ideas of the pathology of the disease, namely, that pernicious anemia is due to disturbances of the blood-forming organs rather than to loss of blood by minute recurrent internal hemorrhages.

MISCELLANEOUS CASES.

Forty-five stools were examined in a group of 11 miscellaneous cases. In 9 cases only negative results were found; these were 2 tuberculous peritonitis, 1 tubercular adenitis, 1 rheumatic purpura, 1 diaphragmatic pleurisy, 1 myocarditis, 1 abdominal aneurism, 1 secondary anemia, 1 senility.

One case of cardiac insufficiency with severe passive congestion gave two positive results. One case was unique in our experience. The blood test was almost invariably positive and no satisfactory explanation was found.

CASE 12.—Male, aged 73, was previously well, but in the past month lost strength. Dizziness, slight edema of ankles, vague digestive symptoms were present. General condition was good. Physical examination negative, except as follows: Hgn., 55 per cent.; reds, 4,000,000. Gastric contents after test meal, 90 c.c., free HCl 0, total acid 4. Fasting stomach contents normal. Stools at times were slightly loose and contained a little mucus. Subsequent analysis of gastric contents gave the same result. Thorough examination of the rectum and lower sigmoid with the proctoscope showed nothing abnormal.

Occult Blood.

January 29, intense.	March 6, negative.
February 5, intense.	March 16, positive.
February 13, intense.	March 27, positive.
February 20, positive.	April 3, positive.
February 27, positive.	April 16, faint positive.

The patient was at first suspected of cancer, but entire recovery from the anemia and a steady persistent gain of 13 pounds weight in ten months rules it out.

In this case the blood reaction made the diagnosis more difficult. Ewald[4] thinks this is frequently the case.

SUMMARY OF CASES.

The summary contained in the table gives the number of cases seen and stools examined, with the number of positive and negative results.

The summary of our positive results is instructive.

Ten out of 12 cases of cancer of the stomach gave only positive results.
Two cases of cancer of the stomach gave both positive and negative results.
Two out of 3 cases of cancer of the bowel gave only positive results.
Twelve out of 14 cases of acute gastric ulcer gave both positive and negative results.
Four out of 5 cases of chronic gastric ulcer gave both positive and negative results.

In only 8 of the remaining 163 cases were any positive results obtained as follows:

Two cases of cirrhosis of the liver.
Two cases of ulcerative colitis.
One case of severe acute gastritis.
One case of severe passive congestion of the bowel.
One case of benign pyloric obstruction of severe type.
One case of anemia and gastric anacidity (Case 12).

Four-fifths of all our positive results were in cases of cancer and ulcer of the stomach or bowel.

TABULATION OF CASES.

Diseases.	Cases.	Stools examined.	Cases with only negative results.	Cases with both positive and negative results.	Cases with only positive results.
Normal stomach	10	30	10	..	..
Functional gastric diseases:					
Subacidity	17	57	17	..	..
Achylia	6	22	6	..	..
Hyperacidity	22	67	22	..	..
Other neuroses	28	70	28	..	..
Chronic gastric catarrh	6	27	6	..	..
Acute gastric catarrh	5	24	4	1	..
Acute gastric ulcer	14	127	2	12	..
Chronic gastric ulcer	5	37	1	4	..
Recurrent (?) gastric ulcer	8	22	8	..	..
Benign pyloric stenosis	5	22	4	1	..
Gastric cancer	12	77	..	2	10
Diseases of bowel:					
Neuroses	7	22	7	..	..
Ulcerative colitis	4	24	2	2	..
Mucus colic	3	9	3	..	..
Chronic catarrh	3	9	3	..	..
Chronic appendicitis	1	3	1	..	..
Cancer	3	7	1	..	2
Diseases of liver:					
Cirrhosis	9	35	7	1	1
Gallstones	5	13	5	..	..
Cancer	2	6	2	..	..
Pernicious anemia	11	45	11	..	..
Miscellaneous cases:					
Tuberculous peritonitis	2	8	2	..	..
Tuberculous adenitis	1	4	1	..	..
Rheumatic purpura	1	3	1	..	..
Diaphragmatic pleurisy	1	2	1	..	..
Myocarditis	1	4	1	..	..
Abdominal aneurism	1	3	1	..	..
Secondary anemia	1	4	1	..	..
Senility	1	4	1	..	..
Cardiac insufficiency	1	3	..	1	..
Anemia with gastric anacidity	1	10	..	1	..
Totals	197	800	160	25	13

CONCLUSIONS.

1. The guaiac or aloin test for invisible blood is, in spite of exceptions, the most valuable single clinical method recently developed for the recognition of latent cancer and ulcer of the digestive canal and as a guide in the treatment of peptic ulcer.

2. The method is very delicate and yet so simple it can be easily carried out by the practicing physician. It must invariably be used in conjunction with the other methods of physical examination.

3. The value of the test depends on the care with which other sources of bleeding are excluded. The interpretation of the results requires some experience.

4. The test in the stools has greater value. Both positive and negative results are significant. Positive results in gastric contents are often misleading, but negative results are significant.

5. Never be content with a single examination, no matter how well the result accords with the previous opinion of the case.

6. In gastric and duodenal ulcer the chief value of the test is: *a* In distinguishing ulcer from a neurosis or disease of the bile passages. *b* As a premonitory symptom of severe hemorrhage. *c* As a measure of the results of medical treatment and as an aid in deciding when surgical interference is needed. *d* In prognosis.

7. In gastric cancer, in diagnosis from anacid gastritis, achylia gastrica, pernicious anemia and similar conditions, and from chronic gastric ulcer.

8. In general, the test has great value in discovering or ruling out hemorrhage in a suspected case.

The majority of these observations were made at the Boston City Hospital. I am greatly indebted to the other members of the medical and surgical staff for the opportunity to study their patients.[18]

DIAGNOSIS BETWEEN DUODENAL ULCER AND GALLSTONE DISEASE.*

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In gallstone disease and ulcer of the duodenum we have two of the principal lesions of the upper abdomen. Because of their frequent occurrence, intimate relation and similar type of symptoms, they often lead into great difficulties in differentiation.

In our clinic 163 cases of duodenal ulcer have come to operation. I here consider 141 which have tabulated histories. Two-thirds of this number (67.4 per cent.) were fairly diagnosticated. One-tenth (10 per cent.) were called gallstones; one-seventh (14.3 per cent.) were thought to be either gallstones or duodenal ulcer. Of those remaining the diagnosis was not stated or they were variously diagnosed as one of three or four different ailments.

The gall-bladder cases have run a higher percentage of correct diagnoses; four-fifths (86.5 per cent.) we have met satisfactorily; about one-sixteenth (6.9 per cent.) were called either ulcer or gallstones, while the remainder were called gallstones or appendicitis (5.6 per cent.) or duodenal ulcer (1 per cent.). It is well to notice here that in about seven-ninths of those cases in which ulcer of the stomach was seriously considered there was duct obstruction and adhesions or some form of chronic trouble. Despite the most painstaking care in history development and clinical observation there will yet remain a rather large number of ulcer cases that can not be differentiated from gallstone disease; while the same may be said of the gall-bladder, but in a less degree. More especially will this be true if the clinician is determined to meet surgical indications in both cases when most opportune for his patients.

It is the early gallstone and early acute type of ulcer, with spasm and perforating tendencies, whose histories are oftenest confounded. Some chronic gall-bladder patients, however, may so complain that stomach lesions seem positive. Still fewer chronic ulcer patients will present symptoms not to be differentiated from biliary calculi unless perforations repeat; that is, early ulcer of the duodenum is oftener mistaken for gallstone trouble than is early gallstone for acute ulcer of the duodenum, while in the chronic stage of both conditions gallstone trouble has oftener been diagnosed ulcer than has the reverse been done.

SYMPTOMATOLOGY.

The symptoms of these two conditions run very nearly the same as to kind, and the field of complaint is often identical. Pain and distress, gas, belching, eructations, vomiting, sour stomach (oftenest in ulcer), jaundice (much more frequent in gallstones), hemorrhage (much more frequent in ulcer), general weakness and nervous irritability. Condition of the bowels and state of nutrition are frequently determining factors. It is the interpretation of these symptoms as they appear singly or combined on which a differentiation depends.

Pain.—Pain in cholelithiasis is usually sudden of onset, with the mid-epigastrium as center. It may have a wide field of radiation, usually to the right costal arch and scapular region. It is severe and lancinating, and spasm of diaphragm is usually observed. The pain comes absolutely irregularly as to time, is independent of and not eased by food, nor often traced to it as a cause. Great anxiety and free perspiration accompany the severe attacks and chills and fever may be observed. Gas often troubles during the attack and gives the sensation of upward pressure often extreme. Vomiting is frequently present, but relief is not so certain to follow in gallstones as in ulcer; hot applications often give a certain amount of comfort, but only morphin or natural return to health stays the terrific pain. Fully as characteristic as is the onset is the rapid disappearance, even at the height of pain, with almost immediate return to normal health. When the above symptoms prevail and no complication has arisen, because of repeated attacks, gallstones may be reasonably considered as the cause of disturbance.

In duodenal ulcer the pain runs in decided periods of attack, lasting from a few days to several months, may, and often does, come suddenly, is usually daily, or several times a day during this period. It is burning and gnawing in character, and if perforation has not complicated affairs or spasm has not been marked it less often reaches the sharp lancinating type of gallstone colic. In the greater number of cases the pain is caused by the irritant action of the acid-acrid contents on the ulcer area of the duodenum (or stomach) itself, heightened by the accompanying spasm and gas formation. In the lesser number it is due to perforating peritonitis,

18. The following references not elsewhere referred to in the text are here appended: Steele: N. Y. Med. Jour., 1906, vol. lxxxiii, p. 125; von Torday: Wien. klin. Rundschau, 1905, vol. xix, pp. 453 and 471; Schumann and Westphal: Ztschr. f physiol. Chemie., 1905, vol. xlvi, p. 510; Koziczkowsky: Deutsche med. Wochschr., 1904, No. 33.

* Read in the Section on Practice of Medicine of the American Medical Association at the Fifty-seventh Annual Session, June, 1906.

a complication more frequent in duodenal than in stomach ulcer, because of the thinner walls of the duodenum. Pain is at its height from 2 to 5 hours after food or just preceding meal hour, and the field of radiation is usually limited to the stomach and duodenal areas. It entirely disappears or is quieted for a time by food, drink, alkalis, vomiting or irrigation; that is, anything that diverts, dilutes, neutralizes or removes this acid liquid brings relief to pain as well as to most of the other distressing symptoms. Until obstruction approaches the easiest moments are those immediately following a meal or when the stomach is wholly emptied by vomiting or irrigation. Continuous distress is rarely met unless motor power is decidedly lessened or large ulcers elsewhere add their baneful influence. In both conditions peritonitis often gives pronounced rigidity and great tenderness, but in (perforating) ulcer they are usually much more persistent. Spasm of the diaphragm is rarely caused by pain of ulcer.

Gas.—Gas as a factor in gall-bladder pathology is of little moment. It is often present during the intense spell, and some relief is usually experienced if eructed, but the bloated, distended, bursting sensation that so many experience is due to the character of the pain and its radiation rather than to gas, as is supposed by so many sufferers.

In duodenal ulcer the history of gas formation is almost as valuable as is that of pain, and frequently on this factor alone a diagnosis depends. This may be the first sign to call attention to a deranged digestion. It appears apparently before obstruction in any degree can be demonstrated, and it surely comes as soon as motor power is appreciably lessened. Few, indeed, are the patients in whom gas is not mentioned as a distressing feature. It is at its height when the pain is greatest, from 2 to 5 hours after meals, and may be the cause of the distress, the result of overdistension of the stomach. The same measures relieve gas that relieve pain—food, drink, alkalis, vomiting and irrigation. The greater the degree of acidity the greater the degree of discomfort from gas as well as pain, and it is only in those cases of ulcer in which acidity is not increased or is diminished and obstruction is absent that gas and pain are not complained of, because, first, the irritant to the membrane is then lacking, and, second, spasm is not induced.

Vomiting.—Vomiting is common to both troubles and should be of less importance than the two already considered, because in the early stage of each disease, when diagnosis should be made and treatment instituted, vomiting is not so frequently a significant factor. In gallstones it appears soon after the initial pain and may give more or less relief; it is profuse only if the attack comes on soon after a meal and then the normal food and normal acid condition will be recognized. Usually the intense nausea produces severe retching, followed by a greenish, bitter fluid and mucus.

A very different picture is present in ulcer. In the earlier stage nausea and eructation are oftener present than is vomiting, and when in the earlier history it is present it is rarely profuse, is acid-acrid, and bitter-burning. For a time relief follows the vomiting. As the trouble progresses the picture intensifies until vomiting may become not only distressing, but threatening. It varies in time, intensity and quantity. Rarely, indeed, does it come immediately after food, and only then, if there is much stasis and the meal has overburdened the remaining stomach capacity. Usually vomiting begins from 2 to 4 hours after food, when pain and gas are greatest, and, unless hypersecretion is present, dilatation marked, or obstruction advanced, the amount is not great, but irritating. Just as often we get a history of daily vomiting, or every second or third day, a few hours after the evening meal; then the pain is marked, the quantity of vomit is large and frequently so eroding that the teeth suffer. Relief follows this copious amount, until added ingesta and stomach secretions again lead to a similar condition. These are the cases in which motor power is decreased either through dilatation, obstruction or other cause; that is, the train of vomiting varies as does the degree of dilatation, amount of obstruction and quantity and acidity of secretion. Also the kind and amount of food is a factor, acids (salts and less often sweets) are the ones most frequently left from the diet list. To the food the sufferer usually traces the complaint and, except there be obstruction or marked dilation, he too often fails to find relief through diet, though he may find amelioration.

Hemorrhage.—Hemorrhage in gallstones is rare and may be an accidental accompaniment. In ulcer it is not infrequent, but we must be ready to diagnose ulcer of the duodenum without hemorrhage, or many of our patients will suffer unto death. Blood varies from mere traces found while irrigating the stomach to huge quantities vomited or passed by the bowel. By this single manifestation of ulcer we must occasionally make our diagnosis, for blood from the stomach in an otherwise healthy person should be taken as evidence, even when all so-called dyspeptic symptoms are wanting. When passed by the bowel it is usually dark, tarry, granular and will rarely be mistaken for hemorrhage lower in the tract. Fainting and collapse with sudden anemia accompany decided hemorrhage of the stomach, and even when not in great amount the effect may be profound.

Jaundice.—Jaundice in gallstones, like hemorrhage in duodenal ulcer, ought not to be waited for. In duodenal ulcer it is rare, only following when the papillary area is invaded or, after perforation, when adhesions have formed and complicated the gall ducts. This condition, however, is not frequent. In neglected gall-bladder trouble jaundice follows, 1, the forcing of a stone into the common duct; 2, inflammation of the ducts; 3, pressure of stones within the gall bladder on the common and cystic ducts at their junction; 4, swelling of the pancreas and resultant pressure on common duct; 5, perforation and adhesions. When jaundice follows sudden and severe pain in the gastric or gall-bladder area with radiation backward, one can make no intelligent diagnosis save gallstones. If ulcer exists, nothing but a guess will make the differentiation, except surgical measures.

Condition of Bowels.—This is a distinct factor in the diagnosis of duodenal ulcer. Often the patient will complain of constipation early in ulcer history, even when the troublesome element (of digestion) can be diagnosed nothing more than hyperchlorhydria or hypersecretion, but as the disease progresses and motor power lessens either from obstruction, spasm or myasthenia, constipation increases and is at times the great complaint for which relief is sought. Constipation usually varies with the spells, and during the intermission the bowel may be tolerant if not normal. Late in the disease the bowels are usually obstinate, so also are the other symptoms. In gallstones the bowels play a much less important rôle. In jaundice we have the clay stools and

at times constipation, but rarely at any stage that obstinate condition so frequent in advanced ulcer.

Loss of Nutrition.—This is often seen in ulcer of the duodenum, more frequently, however, in the later stages. Early, the gain follows rapidly on the path of intermission or loss and gain may not be marked in degree either way. Simply, if the trouble developed during the period of natural growth, normal gain may never have been realized. Late, the nutrition usually suffers and at times so profoundly that the patient when he presents himself at the clinic is practically moribund.

In early gall-bladder trouble we rarely find nutrition affected. The attacks are short and widely separated, vomiting infrequent and if present there is little or no sacrifice of material ingested and, there being no food delay its nutritive value has not been changed or lessened. A poor state of nutrition is reserved, first, for the common-duct cases; second, those with more or less chronic jaundice from any cause; third, the chronic sufferers who have developed stomach symptoms through adhesions, ulceration or constant gall-bladder irritation. Pancreatic infection following this latter class of cases is a potent factor in nutrition.

Ulcer will often be closely simulated by, 1, duct obstruction; 2, some chronic forms of cholecystitis, and, 3, gallstone cases in which one or a few large stones are in a shrunken gall cyst.

Stomach Contents.—Analysis of the stomach contents has a degree of determining force. In uncomplicated gall-bladder disease the gastric contents will be normal. In ulcer the acidity runs above normal in the larger number of cases, being about that found in peptic ulcer elsewhere. Blood may be found in traces or in large quantities, not constant at all, unless large areas are involved, and obstruction, dilatation and myasthenia are marked.

CONCLUSION.

To sum up, we may say that pain in cholecystitis is sudden and severe, usually has a wide field of radiation, comes with no regularity as to time, is rarely caused by food and as rarely eased by it, nor does the patient often trace his distress to it. There is no stomach history between the short sharp attacks; spasm of the diaphragm with dyspnea is common, vomiting and gas, if present, are so only during the colic, and the relief from eructation and vomiting is not so marked as in ulcer. Nausea and intense retching may be followed by vomiting of a small amount of thin, yellowish, bitter liquid mixed with mucus.

In duodenal ulcer pain comes in periods of attack lasting for days or weeks, is often sudden, may be severe, yet usually not that intense type of pain met in gallstones, but rather gnawing and burning in character. It may be irregular as to time of the separate attacks, but regular during the period of the stomach disturbance. The pain is clearly related to food, the intensity often modified by kind and quantity taken. Food eases for a time, the pain returning from 2 to 4 hours later. Hot drinks, soda and irrigation give relief. Spasm of the diaphragm is rarely seen except in some cases of perforation.

The chronic gallstone case, with impacted stone, ulceration and adhesions in which no jaundice appears and the stomach symptoms as gas, vomiting, burning distress, sour eructation, impaired appetite and dilatation predominate, and the pain is moderate and follows food, will too often be diagnosticated ulcer; while the duodenal case, in whose early history we can elicit only irregular attacks of sudden, sharp, intense pain of peritonitis or acute spasm (and with no obstruction or hyperacidity) we do not have gas, vomiting or sour eructations, will as surely be mistaken for gallstones.

To the conceits of surgery we shall too often be obliged to leave the differentiation of this class of cases and to its comprehensiveness the surety of relief.

DISCUSSION

ON PAPERS OF DRS. WHITE AND GRAHAM.

DR. GARRY DE N. HOUGH, New Bedford, Mass., said that in the diagnosis of gallstone disease one occasionally meets with an abnormally situated pain and would be exceedingly apt to be misled unless attention was called to this fact. In one case the pain simulated a renal colic on the left side. In three cases the pain was in a situation hitherto undescribed, viz., starting in the left sacroiliac synchondrosis and passing through to a point about an inch below the umbilicus and a little to the right of the median line. Tenderness in the gall-bladder region and the history of the case made the diagnosis possible.

DR. GEORGE W. MCCASKEY, Fort Wayne, Ind., discussing Dr. White's paper, said that he knew of the difficulties in the way of diagnosis, especially in the way of excluding minute gastro-intestinal hemorrhages, which was only equaled by their importance when present. It was true that this did not aid in diagnosis in the early stages of malignant disease; for, as all know, there is no tendency for ulcerative processes to occur in the early stages of malignant disease, while in ulcer it was different, and important help can be secured. Dr. McCaskey called attention to the importance of small hemorrhages as factors causing symptoms and influencing the prognosis, independent of their diagnostic aid. It was well known that minute quantities of blood lost from the system, covering periods of months possibly, might produce a grave type of anemia, such as was produced by ankylostomiasis, although a hemolytic toxin may here coöperate. But the general conclusion was that small quantities of blood removed from the body each day might finally produce grave types of anemia, and he believed it was important to draw attention to this kind of bleeding. He said he had seen several cases. He referred to the case of a man aged 65, with no other history than a gradually increasing anemia and asthenia. The physical examination revealed absolutely nothing. The surgeon who was called in could find no indication that would warrant or justify an exploratory procedure. The feces were examined for blood, but none was found. But a second examination, made a week or two later, revealed blood, and when continuous search was made larger quantities were found. The diagnosis of an ulcerative process in the colon was made, this conclusion being strengthened by finding small fecal masses which had apparently been forcibly detached from the mucosa. The patient was treated accordingly and a prompt recovery followed, the patient remaining well for a long time. Dr. McCaskey believed that a great many cases of progressive anemia and emaciation were due to occult hemorrhages as described by Dr. White.

Clinical Notes

A SIMPLE, EASY AND EFFICIENT METHOD OF ANCHORING A MOVABLE KIDNEY.

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Indications for the performance of this operation have long ago been elucidated and to the modern doctor, skilled in the interpretation of symptoms caused by injurious degrees of renal mobility, these indications are clear and positive. The hesitation, so often manifested by patients and shared by the family physician and in

no small degree by many surgeons, to advise fixation of a kidney injuriously mobile, has been incident to the fact that too often there has been no relief of the symptoms in friends and patients previously operated on. This failure need not exist when the operation is properly performed. The problem is no longer how to prevent recurrence of excessive mobility. Indeed, one caution is to avoid too rigid fixation. The real problem, however, is to fix the organ properly in its normal location with its upper pole in proper relation to the eleventh intercostal space, twelfth rib and spinal column, and not so low nor so far from the median line as to cause tension on the renal vessels and nerve plexus. This needs no emphasis to those of us who constantly hear the complaint from those previously operated on that their symptoms are not relieved and find on examination the kidney firmly fixed in a position too low and too far removed from the median line.

The old method of delivering the organ on the back to pass the fixation sutures is entirely unnecessary, even if the surgeon should prefer to remove the capsule. Decapsulation is never necessary in order to secure fixation, and I have often wondered why any surgeon should perform this as a part of nephropexy. There are, moreover, definite reasons why the organ should not be delivered on the back into the cold world, from its warm, cozy corner behind the peritoneum and colon, and on the right side, the liver, where it is kept snugly and additionally protected by a blanket made of its fatty capsule. The additional shock incident to chilling and to traction on the renal plexus of sympathetic nerves, while in no case not inconsiderable, is in some cases of real consequence.

From the hilum of the kidney to the skin overlying the erector spinæ muscle, is generally, at least, three inches; and from the median line of the vertebral column to the renal hilum the distance rarely exceeds two to three inches, and even this is greater than the length of the shorter of the two renal vessels. Indeed, the shortness of the right renal vein is sometimes the cause of embarrassment to the operator when performing right nephrectomy and the proximity of this organ to the vena cava is universally respected. The renal vessels must therefore be stretched to at least double their lengths to make delivery of the organ a physical possibility, and when it is remembered that they are joined to their fixed parent trunks (the aorta and vena cava) at a right angle, it is manifest that they must be actually stretched. Diminution of caliber in the renal vessels is, therefore, proportionate to the amount of stretching thus caused. The effect of constriction is manifestly more marked in the case of the vein (since this structure is possessed of thinner coats than those of the artery and is without the counteracting effect of pulsation) and marked passive engorgement is the result. If, during the process of delivery, the organ should be even slightly twisted on its pedicle (the vessels and ureter), the injurious effect is obviously more marked. Gangrene of the kidney has occurred.

In at least one case in which the kidney was thus necessarily pulled out for the purpose of removing a calculus, the pancreas was unexpectedly found adherent to the anterior surface of the kidney and was consequently injured. In this particular case death followed on the third day after the operation, and autopsy showed fat necrosis of the omentum.[1] Everyone knows that the duodenum is not rarely adherent to the right kidney even when the latter is movable.

1. Bradford, S. S.: Medical Record, July 21, 1906.

In every case the kidney is necessarily contused during the act of delivery, even when the operator is gentle in his manipulations through a large incision. Thus, in many cases the organ is considerably injured. The minute structure of the kidney is delicate and highly organized; and while, in many cases, the organ tolerates positive insults, these will be minimized as much as possible by the conscientious and skilful surgeon. All of these effects are obviated, and the kidney securely maintained in its normal position by a single suture placed at the outer convex border of its lower pole.

CASE REPORT.

The following case illustrates the ease and efficiency of the method of thus performing the operation:

Patient.—Mrs. H., aged 44, for years the victim of recurrent abdominal pain and of that type of "indigestion" which I choose to call pseudo-gastro-enteric catarrh,[2] was referred to me May 26, 1906.

Examination.—On examination, the right kidney was found to be freely movable to the third degree, i. e., on deep inspiration the organ slipped downward past the anterior examining hand and failed to return to its normal location during expiration, while the fingers were held above its upper pole. In addition she suffered with uterine fibroids. I unhesitatingly advised that the kidney be anchored, the uterus be removed and that both operations be performed during the same anesthesia.

Operation.—A week later I operated. Under ether anesthesia, with the patient in the left lateroprone position and on a pillow so placed under the opposite loin as to widen the right iliocostal space, a three-inch incision was made, extending from the twelfth rib vertically downward along the right margin of the erector spinæ muscle. The lumbar muscles were separated, not cut, and the ilioinguinal and iliohypogastric nerves were isolated, so as to avoid being cut or caught in the sutures. By means of pressure by an assistant's fist anteriorly, the kidney was held within easy reach. Separation of the perirenal fat from the lower half of the organ was easily effected for about an inch, so as to expose the true renal capsule. This fat was not stripped entirely away from the kidney and need in no case be removed. By means of a curved needle threaded with No. 3, twenty-day chromicized catgut, a single suture was then placed at the lower pole of the kidney through its true capsule and a small proportion of the renal cortex, according to the method of Brödel as follows: The suture was passed from above, downward for half an inch, then from below upward, the needle entering a quarter of an inch from its previous point of exit and coming out near the point of entrance.[3] The capsule of the kidney was then scratched and rubbed with gauze to facilitate the formation of scar tissue to further aid fixation. The two ends of the fixation suture were then passed through the muscles at the upper part of the posterior edge of the incision and securely tied. When the assistant's fist was removed the organ was seen to occupy its normal position and failed to move with inspiration.[4] The wound was then dried with gauze and closed without drainage. Three sutures of silkworm gut and one of horse hair closed the skin wound completely. The time required was twelve minutes.

The patient was then placed on her back and an easy hysterectomy was performed. A small, plain gauze dressing to each wound was held in place by adhesive plaster, a wad of gauze about the size of an adult fist was placed anteriorly, to make moderate pressure over the region of the kidney for twenty-four hours and both dressings secured by an abdominal binder.

Further History.—There was no shock, no vomiting; convalescence was uninterrupted and at the end of three weeks the patient was out of bed, and four days later discharged, cured. I may add that at the end of seven days following the operation

2. Charlotte Med. Jour., March, 1906.

3. This method of suture is well illustrated in the sixth edition of White and Martin's text-book of "Genito-Urinary Diseases."

4. I would emphasize that one suture placed in this manner, especially when supplemented by irritation of the capsule and surrounding tissue, is amply sufficient to cause firm fixation.

she was allowed anything she wanted to eat, and in abundance. At the present time she is without a symptom, is eating food which she has not taken for fifteen years, is heavier than she has been during this time and is gaining weight steadily. Her present weight is 125 pounds, a gain of 20 pounds in two months. The lower pole of the kidney operated on is barely palpable and does not move.

In conclusion I would summarize the cardinal principles on which the treatment of movable kidney is based:

1. Injurious degrees of renal mobility are characterized by: (*a*) recurrent attacks of abdominal pain of the character of ureteral or renal colic; and (*b*) remittent periods of indigestion of the type of pseudogastroenteric catarrh, finally causing true catarrh of the alimentary tube; and (*c*) a kidney which, on deep inspiration, moves downward to a sufficient extent to be maintained in this location during expiration, by the examining hand placed anteriorly at its upper pole.

2. Such a kidney is a menace to its own health and to that of the individual, and should be sutured to the overlying muscles in its normal location. The so-called "palliative treatment" by means of pads, corsets and trusses, together with the rest cure, is inefficient, time wasting and may do harm.

3. The old method of pulling the organ out of its nest, on to the back, for the purpose of placing the suture, is entirely unnecessary and entails great risk to the integrity of the organ and its anatomically related structures, sometimes resulting disastrously.

4. The operation as here described, with one properly placed suture at the lower end of the kidney, will maintain the organ in its normal location with its upper pole anterior to the twelfth rib and eleventh intercostal space, its lower pole just above the level of the umbilicus and its outer convex border even with and not external to the outer border of the erector spinæ muscle. Such an operation is efficient and should be attended by no mortality.

There is no longer any justification for allowing these patients to suffer the misery and semi-invalidism incident to injurious degrees of renal mobility.

506 East Grace Street.

CONGENITAL ABSENCE OF UTERUS, BROAD LIGAMENTS, TUBES AND UPPER TWO-THIRDS OF THE VAGINA.

VICARIOUS MENSTRUATION RELIEVED BY OÖPHORECTOMY.*

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CINCINNATI.

The case here reported is one of more than usual interest, inasmuch as I have been unable, by extensive inquiry and correspondence, to locate one in which the history is parallel.

History.—Miss F., aged 18, consulted me Sept. 23, 1900. She was a bright, intelligent girl of rather slight build. She stated that she had never menstruated. I thought nothing particularly strange of this, however, as occasionally one meets cases in which this function does not manifest itself until the age of 17, 18 or 19 years. In fact, I had at that time a patient, a well-developed girl of 19, in whom the menses did not appear until the eighteenth year.

The patient further stated that at intervals of about every three months since she was 16 years of age, she had "swellings," as she termed them, in the right and left iliac regions. These points were tender and painful, especially on pressure. No pain or tenderness had ever existed in the region where the uterus should lie. No pain or heaviness were experienced in the back or thighs, although a sense of heaviness manifested itself in the locality of the "swellings" when the latter developed. No vaginal discharge had ever been present. She stated that for a period following these attacks she had what she termed a "bloody flux" which lasted several days, at the cessation of which her whole trouble disappeared.

Examination.—There was a complete stenosis of the vagina about one and one-quarter inches from the external vulvar orifice. I made a thorough bimanual recto-abdominal examination of the internal genitalia and discovered a complete absence of the uterus and the upper two-thirds of the vagina, the latter ending at the point of occlusion. I thought I could define the ovaries over against the iliopelvic walls, but could detect no evidence of the presence of the tubes or broad ligaments.

Diagnosis.—My diagnosis was vicarious menstruation produced by the absence of the tubes, broad ligament, uterus and upper two-thirds of the vagina. With the presence of a well-developed pathologic menstruation giving rise to symptoms which were serious in nature, I decided that abdominal section with removal of the ovaries (of whose presence I was positive), was justifiable.

Operation.—On September 25, at the Good Samaritan Hospital, in the presence of several physicians, I opened the abdomen. The internal field, exposed to view by the aid of broad retractors, presented a picture which was at least unusual. There was no uterus, no upper two-thirds of the vagina, no tubes or broad ligament. The ovaries hung suspended in folds of the peritoneum from the sides of the pelvis; they were removed and the wound closed. The patient made an uneventful recovery from the operation, which was followed by an easy establishment of the menopause. She has since married.

The professional value of this case, outside of the fact of its almost unparalleled occurrence as a congenital deformity, is of great weight and importance. It furnishes conclusive evidence of the fact that the stimulus which produces menstruation originates in the ovaries, and also that this important function can be fully discharged in the complete absence of every other pelvic organ of the internal genitalia; proof conclusive, in my opinion, that the ovary is the primary organ of menstruation. I am unable to say, however, that the uterus is not a coincident primary organ of menstruation. I am inclined to believe that the impulse which generates menstruation originates spontaneously at the same time in both the uterus and ovaries; but that the mechanical evidence, the menstrual débris, must result from circulatory changes in the ovary; this fact being further proved by its absence after the removal of the ovaries. Proof of this statement is furnished us in the occurrence of the periodical nervous crises present in women at the time of the menopause, whether the latter is established by nature or by sudden operative removal of the ovaries, and the occurrence, also, of certain symptoms of uneasiness about the pelvis, with the presence, at times, of a peculiar uterine discharge at these periods and due reflexly to disappointed nerve impulses.

In answer to correspondence, Mayo says: "I have seen but four cases of the kind you are reporting." Kelly says: "We have had a number of such cases here and rarely have done an operation."

This statement brings out the point I wish to emphasize, viz.: that the diagnosis was confirmed in my case by operation. So far as I am able to judge, in all similar cases about which I have been able to get any information, the diagnosis was made by external abdominal examination and not by actual internal exploration of the abdominal cavity.

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* Read at the meeting of the Ohio Valley Medical Society, Louisville, Ky., Nov. 14, 1906.

Baldwin says: "I have never seen a parallel case," while Ochsner writes: "I have had similar cases, in which there existed a rudimentary formation of the uterus, tubes or vagina and in which these organs were represented by fascia-like formations, but I have never seen a case in which the uterus was entirely absent."

628 Elm Street.

COMPLETE INVERSION OF THE UTERUS WITH PROLAPSE.

A. C. OLMSTED, M.D.
WELLS, NEV.

The comparative infrequency of the condition and some unusual surroundings prompt the report of this case.

Patient.—L., Shoshone squaw, aged 29. This was the sixth pregnancy and was normal so far as I was able to learn. She is half-civilized and lives in a frame house, but adheres to the custom of seeking solitude out of doors at the time of labor.

History.—I was called Sept. 20, 1906, and was told at the time that the child had been born two hours, but the placenta had not yet come away. I reached the patient four and one-half hours after delivery, finding her in the sagebrush, near a mountain stream, lying on the ground with only a blanket for covering.

Examination.—I found her suffering from shock and half-conscious; pulse was 135, but the extremities were warm. Her husband said that she had complained of but little pain. I found the placenta lying on the ground between the thighs, completely detached and with membranes entire. Saturation of clothing and soil gave evidence of a profuse hemorrhage. A tumor, larger than a large orange, projected from the vulva. Bimanual examination showed this to be the inverted and prolapsed uterus, the entire body of the organ being outside the vagina.

Treatment and Result.—After cleansing as well as was possible under the circumstances, the fundus was pushed upward until it passed the relaxed cervical ring. The fingers in the uterus then held the fundus well up until a contraction occurred.

Improvement was rapid, and an hour later the patient said she was "all right." I did not see her again for three weeks, but received daily reports of her rapid and steady recovery. On Oct. 12, 1906, she came to my office for examination. The uterus was found to be of normal size for corresponding period of puerperium; there was no indentation of fundus, no tenderness, no prolapse. The patient denied having pulled on the cord, and said that she was in a recumbent position at the time of delivery. The husband said, however, that she had pulled on the tumor, but soon desisted on account of pain.

A RARE FORM OF MALIGNANT TUMOR OF THE TESTICLE.

WILLIAM A. ROLFE, M.D.
BOSTON.

The following case is reported as being of interest, more especially from a pathologic viewpoint:

History.—C. D. R., aged 38, married, of good previous history, noticed in August, 1906, a commencing enlargement of the left testicle. This was thought to be due to a slight injury received while riding a bicycle. The man was first seen in October, at which time he was in good physical condition except for the enlarged testicle, which was moderately painful, and caused considerable discomfort from the dragging sensation along the cord. The patient's paternal grandfather died from cancer of the liver, but otherwise the family history was unimportant.

Examination.—The testicle was found to be uniformly enlarged, measuring about 8 cm. in length by 6 cm. in diameter. The epididymis could not be clearly made out, and there was an absence of fluid in the scrotal sac. Pressure on the testicle caused much pain. Operation was advised at this time but declined, and the patient left for his home in a distant city. I did not see the patient again until December 3, at which time the testicle was much larger and there was a history of a loss of 25 pounds in weight. At this examination my attention was directed to a small node situated in the skin over the right costal margin in a line with the right nipple. This was hard and painful on pressure, and appeared to be a metastatic growth, but operation on the testicle was advised for the relief of pain and increasing discomfort.

Operation.—Castration was done and the postoperative history was uneventful.

"*Macroscopic Examination.*—On section the testicle presented a dark red appearance, was firm in consistency and suggested a melanotic sarcoma. The tumor, together with the skin node, was sent to the pathologic laboratory of the Boston City Hospital, and the following is the report of the pathologist, Dr. Samuel T. Orton: "Specimen consists of a tumor, a flat sheet of tissue, and several fragments preserved in alcohol; it is ovoid, about 9 cm. in length by 6 cm. across. At one end are the remains of the caput epididymis. On section it is dark red in color with a few small grayish areas at various points especially near its periphery. The flat (tunic) membranous sheet varies in thickness in various areas; one of the smaller pieces is an elliptical piece of skin about 2 cm. in diameter with a firm nodular mass at its center.

"*Microscopic Examination.*—The tumor is largely disintegrated and hemorrhagic. The few intact areas consist of groups of polyhedral cells more or less surrounded by a layer of flat, deeply staining (syncytial) cells, some of which are multinucleated. The tumor in the skin is of the same structure. Tunic shows chronic inflammatory change, but no tumor masses.

"*Diagnosis.*—Chorion-epithelioma. Chorion-epithelioma in this site places the tumor among the teratomata."

Subsequent History.—The patient died December 25 from metastatic involvement of the lungs.

The attending physician, Dr. W. T. Crosby, Manchester, N. H., used the trypsin treatment for cancer, but with no apparent benefit.

A tumor of this nature is rare in the testicle, and I have been unable to find any reference to a similar case.

755 Boylston Street.

SCURVY IN AN ADULT.

A. F. MAISCH, M.D.
GLOBE, ARIZ.

Patient.—Male, American, aged 33, robust; height 5 feet 9 inches; weighed 173 pounds; complained of bleeding from the mouth and pain while chewing food. Condition had existed two weeks.

History.—Negative family history; no hemophilia; no serious illness; denies lues.

Examination.—No apparent anemia or enlargement of lymphatics; muscles were solid, no tenderness on pressure. Heart, lungs and kidneys normal. Mouth showed slight oozing of blood at the margin of the gums; no pus; bleeding free on slight pressure and also hemorrhage from numerous areas on hard palate. On further questioning, patient said he had been employed building roads on an Indian reservation for the past five months. His food during this time had been limited to such articles as beans, coffee, salt pork and potatoes; once a week had fresh meat, but no fruits or vegetables, except potatoes.

Diagnosis.—Scurvy.

Treatment Local.—Saturated solutions of potassium permanganate as mouth wash; an 8 per cent. solution silver nitrate to gums, also hydrogen peroxid to check bleeding. Constitutional: Lemons, oranges, fresh meat and vegetables.

Result.—Pain became less after 12 hours; bleeding ceased in 48 hours. Two weeks later the patient was entirely well.

UNIQUE CASE OF FOREIGN BODY IN THE BLADDER.

J. F. BALDWIN, M.D.
Surgeon to Grant Hospital.
COLUMBUS, OHIO.

While the literature of foreign bodies in surgery is voluminous and interesting, the case detailed below is, so far as my investigation of the literature goes, entirely unique, especially as regards the snare devised by the patient for the removal of the foreign body.

History.—An old soldier, aged 70, for several years had been troubled with prostatic retention of urine. For about a year he used a catheter, which while it answered the purpose fairly well, was not entirely satisfactory. He therefore took a piece of steel rod, about two inches long, rounded it at one end and flattened it at the other, and through a perforation in the flattened end passed a fine wire to be used in withdrawing the device, which, as thus made, very much resembled a sinker, such as boys sometimes use in fishing. He had a capacious urethra, and by lying down and allowing this sinker to drop into the deep urethra and into the neck of the bladder, the obstruction was so displaced that he was able to urinate without difficulty. He found the device exceedingly satisfactory and had used it for about a year when, unfortunately, the wire rusted where it passed through the hole in the sinker, and the latter was left in the bladder. The wire had been purely for the purpose of withdrawal, since he relied on the weight of the sinker for its passage into the bladder. To remove the metal, and without consulting a physician, the patient bent a wire into an elongated loop, as shown in the cut. He had a piece of steel from which he had made his original sinker, and in bending his loop he so made it that when the

ends of the wire were approximated the sinker might engage in the loop and then be caught by separating them. With great fortitude he introduced this loop into the bladder, and spent considerable time in a fruitless attempt to snare the sinker. He finally consulted his physician, Dr. Kious, through whom the case was referred to me for operative intervention.

Operation.—An ordinary suprapubic cystotomy was performed Dec. 9, 1905, through which the piece of steel was easily removed. The obstruction was found to consist in a transverse bar in the floor of the internal meatus. This bar was cut across with scissors, and the surface touched with the electric cautery—a sort of transvesical Bottini. Recovery was prompt and entirely satisfactory.

The accompanying illustration shows the sinker and snare, one-third actual size.

Special Article

SOME FACTS ABOUT DIGESTIVE FERMENTS.

TORALD SOLLMANN, M.D.
CLEVELAND, OHIO.

(*Continued from page 416.*)

OTHER INCOMPATIBILITIES IN LIQUID DIGESTANTS.

The compound digestive liquids do not constitute the only incompatibility in the manufacture or prescription of digestive ferments, although they are probably the most glaring example. We must again recall that ferments are peculiarly unstable bodies; indeed, there are few substances so sensitive to reagents, so liable to injury, as the ferments, especially when they are dissolved. Acids and alkalies, salts, metals, alkaloids, tannins, antiseptics, chloroform, ether and alcohol—all these interfere more or less with the action of ferments and injure their activity. Alcohol is especially important, since it is a conspicuous constituent of the digestive "wines" and elixirs, particularly those of pepsin.

THE EFFECT OF ALCOHOL ON FERMENTS.

A short contact with alcohol does not appear to be injurious to most ferments, since one of the ordinary methods of purifying the crude ferments consists in their precipitation by alcohol. Prolonged contact with alcohol, however, even when quite dilute, causes a gradual destruction. This deterioration is a rather slow process, especially with pepsin, so that there may be no great objection to prescribing a freshly made wine or elixir of pepsin when it is to be used in a few days. The proprietary preparations, however, are generally made a long time before they are administered, and their activity must be very unreliable. As a matter of fact, the preparations of this class examined by the Council proved quite worthless from the digestive standpoint, and the popularity of certain proprietary compounds must be attributed solely to their seductive taste and appearance.

GLYCERIN AS A PRESERVATIVE.

Aqueous solutions of the ferments also deteriorate very rapidly. The only liquid medium in which ferments can be preserved for any length of time is glycerin. In this connection it may be pointed out that the advantage of glycerins of pepsin made by extracting the mucous membrane directly with glycerin, over those made by dissolving dried, soluble pepsin in glycerin, is not very apparent. A carefully made glycerin extract would certainly be better than a cheap glycerin solution, for the glycerin extraction precludes putrefactive changes; but the careful manufacturer of pepsin will have no difficulty in avoiding putrefaction. It may be true that the glycerin extract contains more milk-curdling ferment and is superior for the manufacture of junket. For internal administration, however, this has no significance. Pepsin is used to digest proteids, and this power is possessed by the dry pepsin and by its solution in glycerin. If there are any therapeutic indications for other ingredients of the gastric juice (aside from the acid) they have not yet been formulated. As to the rennin, the most authoritative book dealing with ferments (Oppenheimer) says as follows:

> It does not appear to have any essential significance for the digestion of proteids. It is strikingly absent in the newborn, who consume much milk. Zuntz and Sternberg have even found that milk proteid coagulated by rennin is less easily digested than the original milk proteid, and attribute to this in part the relatively smaller availability of milk for adults, who produce more rennin.

DRY MIXTURES OF FERMENTS.

Since the digestive ferments act only in solution, it might be thought that the object of combining pepsin, trypsin and diastase could be attained by administering the mixtures as dry powders or tablets. These will, indeed, keep indefinitely if they are protected from moisture; but a moment's thought will show that their destruction will begin with their action. The conditions for this will arise the moment that they enter into solution in the mouth or stomach. This brings us to the question as to how far ferments, artificially introduced by mouth, may be effective in the alimentary canal.

THE FATE OF FERMENTS IN THE ALIMENTARY CANAL.

The sojourn of food in the mouth is so short that this need not be considered. The stomach is peculiarly the seat of the activity of pepsin, so that there can be no question that artificially introduced pepsin may develop its activity in this organ. The question as to the possibility for the action of diastase and trypsin is somewhat more complicated. It will be recalled that both these ferments are destroyed by even very low concentrations of acids and by pepsin; on this account it has been supposed, for instance, that the salivary digestive ferment is practically useless.

This view, however, is erroneous, as is demonstrated, for instance, by the careful experiments of Grützner. This investigator[2] fed animals with successive portions of differently colored food. After a variable time the animals were killed, and the stomach and its contents frozen so as to prevent any disarrangement of the food. When this was cut open, it showed that the greater portion of the gastric contents remains unmixed for several hours, the effective churning motions of the stomach being confined to the pyloric portion. Therefore, only the very first morsels of a meal are exposed at once to the digestant action of the acid and pepsin, each successive portion of food being deposited as a successive layer within the preceding portion.

By adding litmus to the food Grützner could show in this way that the reaction within the main mass of the food remains alkaline or neutral for some two hours, pepsin digestion occurring only in those portions which actually touch the walls of the stomach and in the pyloric portion. At the end of this time the process proceeds more rapidly. Grützner also tested the different portions of the gastric contents directly for diastase, and found this present for several hours, especially in the fundus, although it is destroyed before the gastric digestion is completed.

DIASTASE AS A DIGESTANT.

It is evident, therefore, that the diastase of the saliva has a very good opportunity, during several hours, of exerting its action. The same opportunity would exist for diastase artificially introduced if it were equally mixed with the food; it must be remembered, however, that the circumstance which makes the gastric action of diastase possible—namely, the quiet condition of the food in the fundus—would greatly hinder the action of the ferment unless this were taken intimately mixed with the food; for ferments diffuse extremely slowly, and diastase taken after eating would, therefore, have only a very small surface of food exposed to its action. The same holds true of trypsin; but in regard to this ferment it may further be doubted whether the alkalinity of the food in the stomach is ever as high as is necessary for the effective action of the trypsin.

It is evident, therefore, that little can be expected from the action of either diastase or pancreatin in the stomach. If they are to act at all it is necessary that they should escape destruction and pass into the intestine, where the conditions would be reversed; the pepsin being destroyed by the bile, the alkali and the trypsin; while the diastase and the pancreatin could develop their full activity.

CAN THE FERMENTS SURVIVE GASTRIC DIGESTION?

It is, therefore, an important question whether any considerable part of these ferments can pass unscathed through the ordeal of the gastric digestion. In the experiments of Wroblewski, Bednarski and Wojczinski, quoted above, it was shown that peptic digestion completely destroys the trypsin within six hours, the diastase within nine hours. No experiments are reported as to the effects of a shorter digestion, but the destruction of the ferments must have been far advanced or completed in a much shorter time, and we know that digestion generally proceeds faster in the body than in the test-tube.

The experiments of Cannon and others have shown that the main mass of the food remains in the stomach for a considerable time—three hours with a carbohydrate meal, six hours with a proteid meal, twenty-one hours with a fatty meal. It is true that a portion of the food leaves the stomach much earlier, but evidently the main mass of the ferments remains sufficiently long to insure their thorough destruction. This is also shown by Grützner, who found that the salivary diastase has completely disappeared from the stomach before the gastric digestion is completed. Fluids, taken on an empty stomach, pass into the intestine very rapidly, and it is conceivable that ferments introduced in this manner might escape destruction; however, there would be no therapeutic indication for ferments when the stomach is empty. It is, therefore, evident that no effect can be expected from trypsin, unless it is given by "enteric" capsules. Diastase could conceivably be effective if thoroughly mixed with the food, although this is somewhat problematic.

Papain (*Papayotin*): This vegetable proteid-digesting ferment is said to digest in neutral, acid and alkaline media, although authorities differ on these points. On this assumption, however, it has been prescribed as a substitute for pepsin in conditions of achlorhydria; but the success has not been especially striking. Indeed, many preparations on the market are so worthless that the drug is thoroughly unreliable.

ARE THERE ANY THERAPEUTIC INDICATIONS FOR THE INTERNAL USE OF DIGESTIVE FERMENTS?

Digestive ferments are administered on the theory that they supplement a faulty digestion. Evidently, they could only be useful if the digestive disorder is due to a deficiency of ferments. This, however, appears to be a rare condition, and the use of ferments is bound to be useless when the dyspepsia depends on alterations of acidity or on motor insufficiency or on bacterial fermentation. Even when the ferment is really deficient it is doubtful whether the condition is properly met by giving pepsin. The work of Pawlow and his school indicates that the composition of the digestive juices is modified according to the work which they have to perform. Of the workings of this adaptive process we have as yet only the faintest conception, and to attempt to influence them by giving pepsin appears rather as crude bungling. Much more should be accomplished by searching for the causal condition. When this can not be found or remedied, then pepsin may be tried, since it might happen to fit the case, and it is harmless. Any deficiency in the gastric acidity must be corrected or the pepsin is bound to be useless.

2. Pflüger's Archiv., 1905, cvi, 436.

Tablet Medication.—Dr. James F. Percy (*Illinois Med. Jour.*, January, 1907) deprecates the universal use of ready-made tablets by the physician. He holds that it destroys the ambition for a correct knowledge of therapeutics which all progressive physicians should have.

New and Non-Official Remedies

THE FOLLOWING ARTICLES HAVE BEEN TENTATIVELY ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR INCLUSION IN THE PROPOSED ANNUAL, "NEW AND NON-OFFICIAL REMEDIES." THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT, BUT TO SOME EXTENT ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE FINAL ACCEPTANCE AND PUBLICATION IN BOOK FORM.

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT SO FAR AS KNOWN IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

(*Continued from page 421.*)

(A list of all accepted articles is published on one of the advertising pages of The Journal in the first issue of each month.)

COLLARGOL OINTMENT.

UNGUENTUM CREDÉ: OINTMENT OF SOLUBLE METALLIC SILVER.

Collargol Ointment is an ointment containing 15 per cent. of collargol.

It is prepared by incorporating 15 parts of collargol with 5 parts of water, 10 parts of white wax, and 70 parts of benzoinated lard, observing care that the soluble silver shall not be transformed into metallic silver of the ordinary kind. This, it is asserted, it is prone to do unless great care is observed in the manipulation.

The natural color of collargol ointment is dark bluish-gray. The addition of water may impart to the ointment a brownish shade; this does not, however, in any way impair its efficiency. The ointment is good as long as it colors the skin black.

Actions and Uses.—These are described under "Collargol," which see.

Dosage.—From 2 to 4 Gm. (30 to 60 grains)—with children about half this dose—should be rubbed very thoroughly into the skin for from 15 to 30 minutes.

Manufactured by The Heyden Chemical Works, Radebeul, Germany, and Garfield, N. J. (Schering & Glatz, New York). U. S. trademark No. 32,452.

CRESYLONE.

A name applied to a preparation essentially similar to Liquor Cresolis Compositus, U. S. P.

Prepared by Parke, Davis & Co., Detroit, Mich. U. S. trademark.

CUPRO-HEMOL.

HAEMOLUM CUPRATUM.

Cupro-hemol is hemol containing 2 per cent. of copper in organic combination.

It is prepared by precipitating a solution of blood with a dilute neutral solution of a copper salt at a temperature not materially exceeding 0.° C. (32° F.).

Actions and Uses.—Cupro-hemol is said to be useful in tuberculosis, scrofula, anemia, chlorosis, etc.

Dosage.—The maximum dose is 0.5 Gm. (8 grains).

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York). German patent, No. 86,146.

EUFORMOL.

A solution said to contain in each 30 Cc. (1 fluidounce): Oil of eucalyptus, 0.025 Cc. (⅜ minim); oil of gaultheria 0.018 Cc. (3/10 min.); thymol 0.03 Gm. (½ grain); menthol, 0.005 Gm. (1/12 grain); boric acid, 0.78 Gm. (12 grains); fluid extract of wild indigo, 0.076 Gm. (1¼ min.); solution of formaldehyde (40 per cent.) 4.00 Cc. (60 min.).

Actions and Uses.—Euformol is a germicide, antiseptic and deodorant.

It is recommended for external application and for disinfection of excreta in infectious diseases.

Dosage.—For general use euformol should be largely diluted.

Prepared by Parke, Davis & Co., Detroit, Mich.

EXODIN.

Exodin is a mixture of derivatives of rufigallic acid (hexahydroxy-anthraquinone). It contains diacetyl-rufigallic acid tetra-methyl ester, acetyl-rufigallic acid penta-methyl ester and rufigallic acid hexa-methyl ester.

According to the patent it is obtained by treating rufigallic acid tetra-methyl ester with acetic anhydride and sodium acetate and purifying the product by crystallization.

Exodin is a greenish yellow, odorless and tasteless powder, insoluble in water and difficultly soluble in alcohol.

Actions and Uses.—Exodin is claimed to be a pleasant and reliable cathartic. It is said to produce a mild and protracted tonic effect on the digestive tract and to produce neither stomach pains nor colic.

Exodin is claimed to be useful in acute and chronic constipation of the atonic form and also in cases in which regular evacuation of the bowels must be stimulated in consequence of hemorrhoids, etc.

Dosage.—For children, 0.5 Gm. (7½ grains); adults, 1 to 1.5 Gm. (15 to 22 grains) in tablets or in powder stirred up with water. Exodin is sold in the form of a powder and in tablets, each containing 0.5 Gm. (7½ grains).

Manufactured by Chemische Fabrik auf Actien, vorm. E. Schering, Berlin (Schering & Glatz, New York). U. S. Patent No. 751,216. U. S. trademark No. 43,029.

HÆMOFERRUM.

LIQUID OXYHEMOGLOBIN, STEARNS.

Hæmoferrum is a preparation of purified blood said to contain in each 30 Cc. (1 fluidounce), 2 Gm. (32 grains), of oxyhemoglobin in a menstruum containing 12.75 per cent. of alcohol.

It is prepared from purified blood and the amount of hemoglobin determined by assay.

Hæmoferrum is a dark blood-red liquid, of a pleasant odor and taste.

Actions and Uses.—It is claimed that hæmoferrum acts as a preparation of organic iron (see Organic Iron). It is used in anemia.

Dosage.—4 to 8 Cc. (1 to 2 fluidrams) three or four times a day.

Prepared by Frederick Stearns & Co., Detroit, Mich.

IOTHION.

DIIODOHYDROXYPROPANE.

Iothion, $CH_2I.CHOH.CH_2I = C_3H_6OI_2$, is 1,3-di-iodo-2-hydroxy-propane.

Dichlorhydrin, obtained by chlorinating glycerin, is heated with the theoretical quantity of potassium iodide in the presence of water, chlorine being replaced by iodine with the production of di-iodo-hydroxy-propane being produced.

Iothion is a yellowish, oily, heavy liquid, of sp. gr. 2.4 to 2.5, containing 77 per cent. of iodine. It is volatile at the body temperature, and not unpleasantly odorous. It is insoluble in water, but soluble in glycerin, oils, alcohol and other organic solvents.

If Iothion be heated on the water bath under a reflux condenser for 5 to 6 hours, with 33 per cent. solution of potassium hydroxide and the iodine liberated from the residue by sulphuric acid and sodium nitrite and extracted with carbon disulphide, the titration of this iodine carbon disulphide solution with sodium thiosulphate in the usual way, should indicate 77 per cent. of iodine.

Actions and Uses.—Iothion acts like iodine and the iodides, but it is said to be rapidly absorbed by the intact skin.

It is said to be a satisfactory substitute for iodine and iodides, being applied to the surface of the body in the same manner as mercurial inunctions.

Dosage.—It is applied in the form of a 25 to 50 per cent. ointment with a mixture of equal parts of wool fat (lanolin) and petrolatum as a base.

Manufactured by Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany (Continental Color & Chemical Co., New York). U. S. trademark No. 39,252.

(*To be continued.*)

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[*For other information see second page following reading matter.*]

SATURDAY, FEBRUARY 9, 1907.

HORMONES.

This term (derived from ὁρμαω, meaning to arouse or to stimulate) is making its appearance frequently in current physiologic literature, and, supplying, as it does, a well-developed need, seems destined to have an established place in the scientific vocabulary; consequently a discussion of its application and of the subject to which it is applied may be considered profitable. The word was proposed and introduced by Starling to furnish a general name for that group of substances which are characterized by being formed in one tissue or organ for the purpose of stimulating some other more or less remote tissue or organ, to which they are carried by the blood stream. Hormones are, in fact, "chemical messengers," by which one tissue stimulates another to some function, which function is, in the majority of cases, supplementary or complementary to that of the first tissue. The number of hormones with which we are familiar is rapidly increasing, and it is along this line of investigation that some of the most interesting and important discoveries are now being made by the physiologists.

To illustrate the principles of hormone action we can select no better example than the secretin of the intestinal mucosa, which was discovered by Bayliss and Starling in the following way: It had long been known that shortly after the acid chyme enters the duodenum from the pylorus a marked increase in the rate of flow of the pancreatic juice occurs, and also that a similar stimulation could be produced by injecting a weak acid solution into the duodenum. This increase in secretion was at first attributed to a reflex stimulation from the duodenal mucosa, passing through a long arc from the intestinal mucosa to the central nervous system and back through the vagus or splanchnic nerves to the pancreas; later, when it was found that any part of this arc might be severed without decreasing the stimulating effect of the chyme, the reflex was supposed to depend on a more local nervous mechanism connecting the intestine and the pancreas. The above-mentioned investigators, however, finding that after all possible nervous connections between the pancreas and the intestine had been severed, the stimulation of pancreatic secretion still followed the entrance of acids into the duodenum, sought for some chemical stimulant which might perhaps be formed in the intestinal wall under the influence of acids, and from thence reach the pancreas through the vessels. This substance they found in preparations made by extracting the duodenal mucosa in weak acids, and called it secretin, and their observations have been abundantly confirmed. Secretin is, therefore, a chemical messenger, by means of which the duodenal mucosa is enabled to stimulate the pancreas into activity at just the time when the pancreatic secretion is most needed. Secretin is not a complex proteid-like or enzyme-like substance, such as one might expect to be required for such purposes, but a relatively simple alcohol-soluble substance, which resists boiling and other procedures which would quickly destroy enzymes, and in this respect it resembles the other hormones with which we are familiar. Among these may be mentioned the following: The "pancreas activator" of Cohnheim, which is an alcohol-soluble substance secreted by the pancreas, with the function of activating the glycolytic ferment of the muscles; thyroiodin, which seems to stimulate metabolic processes generally, and adrenalin, which is a hormone that seems to be necessary for the excitation of the sympathetic nerves. Starling considers also that the secretion of the liver and of the intestinal mucosa is stimulated by hormones formed in other portions of the gastrointestinal tract. Probably the fetus secretes hormones which stimulate growth of the mammary glands of the mother, while the corpus luteum seems to furnish hormones which influence menstruation and the course of pregnancy. Presumably the internal secretions of the ovary and testicle are hormone-like bodies—indeed, the term hormone is practically equivalent to our more indefinite term "internal secretion," although in the broad sense not all internal secretions are hormones.

Starling explains the existence of hormones on teleologic grounds[1] as follows: In the lowest organisms, before the appearance of any nervous system, it is by chemical means that any coördination of function is determined, and in this case the mechanism has been given the name of chemotaxis. Since the application of these chemical stimuli depends on their diffusion through the medium bathing the cells, the process is necessarily a very slow one, and so far as the communication of one cell with another in the same organism is concerned the process could be quickened by the circulation of a common nutrient fluid, such as the blood. Before the appearance of such a vascular system, however, we find that the need for quick reactions has determined the setting apart of special reactive cells, constituting the nervous system. The whole history of the evolution of the higher types of animals henceforward centers about this nervous system, and it is only with reference to the complexity of this nervous system that man has any advantage over the lower animals and plants. However, the development of a special nervous system, adapted

1. "Recent Advances in the Physiology of Digestion," 1906, W. T. Keener & Co.

for the carrying out of quick reactions, has not abrogated the more lowly and primitive method for coördinating the activities of different parts of the body. Where the necessity does not exist for a specially rapid reaction, as, for instance, in the adaptation of the activities of the digestive glands to the presence of food in the alimentary tract, one might expect to find, as has been found, that the connection between the part of the body receiving the stimulus and the part of the body which has to react to the stimulus should be by chemical means.

THE LABORATORY IN DIAGNOSIS.

The use of laboratory methods in diagnosis is, for the most part, a growth of recent years. While it is true that the laboratory examination of the urine is a procedure which has been practiced by several generations of physicians, the more complicated hematologic, bacteriologic and serologic examinations have come into general use only recently. It is probably no exaggeration to state that fifteen years ago there were not half a dozen medical schools in the United States in which a laboratory course in clinical diagnosis was given. Even ten years ago such courses were rare, and at the present time there are many schools in which they either are entirely inadequate or do not exist. The reason for this lies in the fact that such courses require expensive apparatus, are time consuming, and need men with special training as instructors. In the average medical school instruction in clinical microscopy is seldom given in a hospital, and the subject is often taught by the professor of pathology, who, most likely, has excellent laboratory training, but little clinical experience. In comparatively few schools has the student the opportunity of applying the laboratory methods at the bedside, for in the majority of American schools bedside instruction worthy of the name does not exist.

The effect on the student of the conditions of instruction now existing is often to give him a false idea of the value of laboratory work, and this idea may or may not be dispelled during his final years. If he happens to come under the guidance of a clinical teacher who has passed through the laboratory as a part of his training, and who thoroughly realizes the value as well as the limitations of laboratory work, he may graduate with a just conception of the subject. Very often, however, his teacher is a man who, at the time laboratory methods came into vogue, was too busy to take the time to master laboratory procedures, or too old to grasp their significance. In such a case the student often leaves the walls of his alma mater with a false conception of the use of the laboratory in diagnosis.

A large proportion of the profession in America to-day consists of men who graduated before laboratory procedures, other than the ordinary routine urinary examination, were taught in the schools. Many of them are progressive men, anxious to learn new methods, enthusiastic, hard working, but too often, of necessity, only half trained in laboratory work. It has been impossible from lack of time and opportunity for many of these men to become expert themselves, and they frequently employ recent graduates, or even students, as laboratory assistants, who, depending on their training, have good or erroneous ideas of the value of laboratory methods.

It is perhaps fair to say that the average physician of to-day has too exalted an idea of the science of medicine and too pessimistic a view of the art. The medical profession has been striving so long to drag itself out of the realms of the purely empirical, and has achieved so much in this direction along certain purely scientific lines, that the practitioner, whose laboratory training is, after all, only rudimentary, is apt to overestimate the value of laboratory procedures, and to forget that the application of laboratory methods to clinical medicine is new, and that the results are not to be compared in accuracy with those of the pure, as distinguished from the applied, sciences.

We would be the last to deny that advances of the most far-reaching character have been made by laboratory workers in the last one hundred years. Our whole conception of certain classes of disease has been changed by the work of laboratories, and the treatment of some bacterial diseases has been taken from an empirical and placed on a rational basis by the pure scientists of the profession. All this we acknowledge and glory in, and we would suggest that the glamor which surrounds these brilliant laboratory achievements is one factor which leads the average practitioner to place too high a value on laboratory diagnosis. No one will acknowledge more quickly than the laboratory workers themselves that laboratory diagnosis only reaches its highest usefulness when the findings of the bench are correlated with the findings of the bedside. The profession must learn that, in most instances, the result of a laboratory test should have, in a given case, the same value as a cardinal symptom or an approved clinical sign. Too many men forget this, and fail to correlate the laboratory findings with the clinical findings. Too many sit back in their easy chairs, so to speak, waiting for the laboratory to solve a problem whose solution could often be just as accurately reached by the use of their own eyes, ears and fingers.

There is danger that occasionally laboratory findings may be allowed to take the place of the keen thinking and the educated senses which our professional ancestors used to such good purpose. It lies in the hands of the clinical teachers of this country to overcome the obvious tendencies in this direction. Every practitioner should preferably do his own laboratory work, and, if this is impossible, he should at least know how to properly interpret and correlate the findings of others. Too many errors are made when the physician, lacking in knowledge of the significance of laboratory findings, relies on the reports of the pathologist who lacks in clinical ex-

perience, and who bases his returns on the examination of abstract specimens from a concrete patient of whose history he is usually almost completely ignorant.

THE FOURTH DISEASE (FILATOW-DUKES' DISEASE)?

The mild character of many of the cases of scarlet fever occurring in Chicago and elsewhere at the present time has raised the query whether this epidemic is not an example of the group of cases to which the name of Dukes' disease or the "fourth disease" has been given. It has long been known that German measles presents two varieties, one closely resembling measles and the other approaching scarlet fever so closely that the diagnosis is very difficult and at times impossible. N. Filatow, in 1885, suggested that this form constituted a distinct entity, and has since advocated this view in his works. As early as 1894 C. Dukes referred to the possibility of a new disease comprising these cases, but gave his opinion that the evidence for a distinct disease was insufficient. Later, however, his experience as physician to a large school for boys caused him to change his opinion, and in 1900 he reported[1] three epidemics which furnished evidence sufficient, in his opinion, to establish the existence of a distinct pathologic species, which, for want of a better name, he called the "fourth disease," to distinguish it from the three similar exanthemata, measles, scarlatina and German measles. Certain cases of rubella or rötheln present at first a morbiliform eruption which later assumes a scarlatiniform character. These, however, are not reckoned as examples of the fourth disease.

The cases falling in this new category have the following character, which in many points distinguishes them from genuine scarlatina: the period of incubation is long, two weeks as a rule, contrasting with that of scarlet fever, which averages four or five days; the stage of invasion is absent, the disease beginning with the eruption; vomiting is very seldom observed, the pulse does not reach 100, the temperature averages 101, but may rise to 104, or even with very complete eruption may not rise above 99.4, and usually becomes normal on the fourth day. The throat is only slightly affected, but the lymph glands, especially the post-cervical glands, are enlarged and tender. The eruption is practically indistinguishable from that of scarlet fever and may cover the whole body in the course of a few hours. It appears first on the face and is seen at the corners of the mouth contrasting with the circumoral pallor of scarlet fever. It produces less heat and itching than the eruption of scarlet fever. Albuminuria is rare; the symptoms pass off in a few days, and recovery is rapid and without sequelæ, except that Dukes has observed swelling of the submaxillary glands. Desquamation may be very complete, but is not usually in strips or sheets and bears no relation to the severity of the eruption. The tongue does not peel. The disease is infectious for not more than 21 days where disinfection has been employed. The most conclusive evidence on which Dukes relied to establish the independence of the affection was that which showed that this disease was not prevented by the previous occurrence of scarlatina or rötheln and showed no power to protect against either of these diseases.

Subsequent observation and the criticism to which the cases reported have been subjected have led to a divided opinion. Broadbent,[2] Weaver, F. T. Simpson,[3] P. C. Curtis,[4] Bokay[5] and a number of others have either accepted Dukes' view or reported cases tending to confirm his conclusions. On the other hand, R. W. Marsden,[6] C. B. Ker[7] and others, after studying large clinical material, have found themselves unable to confirm the existence of a distinct disease of this character and, although not denying its existence, hold with Ker that the verdict must be a Scotch one, "not proven." Edson[8] considers this symptom-complex identical with rubella morbiliforme, while Cheinisse[9] regards it as the same as rubella scarlatiniforme, but suggests the name "epidemic pseudo-scarlatina." Probably the conservative opinion of the best observers may be summed up as follows: The epidemics classed under the designation "fourth disease" comprise either cases of rötheln or mild scarlatina or some cases of rötheln and some of scarlatina.

The apparent lack of protection afforded against these diseases may be explained by supposing that both infections prevail and that rötheln attacks those who have had scarlatina and scarlatina those who have had rötheln. It is possible that the previous experience of scarlatina may not always give immunity. At any rate the tendency to multiply varieties of infectious diseases is to be deprecated and the frequent occurrence of atypical forms of all these diseases should be borne in mind. The present epidemic probably comprises a large number of cases of mild scarlatina with occasional examples of diphtheria, measles, German measles and whooping-cough, showing a general epidemic influence under which the development of various atypical forms of infection is greatly favored.

1. Lancet, July 14, 1900.

HEALTH AND HIGHER EDUCATION.

Physicians who are brought much in contact with women who have had the advantages of the higher education, often note instances in which the strain of college and university life seems to have been seriously detrimental to health. There are many sides to the question, of course, and there can be no doubt that the encouragement of gymnastics and athletics in our American colleges for women has been a source of great good

2. Lancet, July 28, 1900.
3. Archives of Pediatrics, 1901, p. 692.
4. THE JOURNAL A. M. A., Aug. 30, 1902.
5. Deutsch. med. Wochschr., xxx, 43.
6. Lancet, Aug. 16, 1902.
7. Practitioner, February, 1902.
8. Brooklyn Med. Jour., March, 1905.
9. Semaine Méd., March, 29, 1905.

for the health of the educated women of this generation. College life has tempted girls to be out of doors much more than was the rule in the past, and this also has been a decided factor for the amelioration of the physical condition of women. When it is remembered that the pale, delicate heroine of fiction has gone out of fashion, and that novelists no longer consider it necessary to introduce heroines who are interestingly nervous, faint on the slightest provocation and have qualms of various kinds, cardiac, gastric and hysteric, almost without provocation, it will be recognized that a great improvement in feminine ideals has come. For this, college life is responsible to a considerable extent.

On the other hand, there are some crying evils that would seem to demand serious attention. Dr. Ralph Wait Parsons, in a recent article,[1] calls particular attention to several of these. The annual report of the New York State Commission in Lunacy for 1902 shows that of over 35,000 women admitted to the state hospitals for the insane in New York during the preceding eight years, over 15,000 (or fully 42 per cent. of the whole number) had been well educated. By contrast, of the 36,422 men who were admitted during the same period, 6,912 (or only 16 per cent.) were reported as having a corresponding degree of education. A difference of nearly three times as many mentally diseased in the two sexes of the same class of the population demands explanation. It would seem to indicate that there is some serious strain put on educated women. It is generally admitted that education always adds much more to the possibilities of mental suffering than to the probabilities of intellectual enjoyment in life, and that women, because they usually have more time for introspection, are more likely to suffer seriously from the bitter things of life than are men, but there would seem to be some much more direct and immediate factor at work in the causation of this generally increased susceptibility.

The question is entirely too serious to be decided offhand. Woman is thoroughly capable of receiving as high an education as man. Whether or not her physical nature is able to stand the strain of the mental work necessary to secure it remains to be seen, however, for it can not be said that our limited experience up to the present time is decisive in this matter. There is no doubt that, in our modern system of education, young girls are often encouraged to overdo their school work just at the time when certain physiologic changes in their nature lower their vitality, and when the exaggerated natural calls that are made on their nervous systems would seem to counsel a quiet and easy life rather than the intellectual and emotional strain of school work. Between examinations and competitions, both of which are taken much more seriously by girls than by boys, demands are made on the girl's energies that may easily leave serious marks behind. At the same time, it must not be forgotten that late hours and the prevalent indulgence in adult pleasures—evening parties, dances, progressive dinner parties, theaters, etc.—are responsible for much of the nervousness and general ill health of growing girls. For any given case of ill health, therefore, it would be unjust to condemn a strenuous educational system as being the sole cause, unless the dissipation common to these days of fast living were found not to be a contributing factor.

At the last meeting of the American Association for the Advancement of Science, as the result of a suggestion in the president's address, a section was established for the study of the science of education. Undoubtedly, one of the most important subjects that this section will have to discuss is the relation of the strain of educational effort to health during the period of adolescence in both boys and girls, but especially in girls.

Physicians should interest themselves in this question, for the educator does not always realize the harm that may be done by his methods, and often the physical deterioration consequent on school work in the teens does not manifest itself until much later in life. Physicians whose work takes them among the students of institutions in which young women are acquiring higher education, should realize that they are in a position to collect data that may be of great importance in the solution of this problem. We are now in the second generation of advanced education for women, and the next generation should be able to know from our experience just what is the result of feminine application to study especially in the years immediately following puberty, and how much truth or falsity there is in the suspicion still held by many, that woman's physical nature, and especially her nervous system, is in many cases detrimentally affected by ill-advised efforts for higher education.

1. The American Girl versus Higher Education, Considered from a Medical Point of View, New York Med. Jour., Jan 19, 1907, p. 115.

SANITARY SECTIONS IN THE ARMY.

In the camps of instruction which were held in various parts of the country during the past summer and autumn, a new principle in camp sanitation was given a trial on the recommendation of the Surgeon General of the Army. The idea was that, if sanitation was to accomplish anything, not only should the recognized sanitary experts, the medical officers, be charged with advising proper methods for the prevention of disease, but that the machinery and personnel necessary to carry the recommendations into effect should also be placed under their control. The principle is so self-evident that it needs only to be stated to be accepted by any thinking man, and the success of the experiment was unqualified. The new organizations were called the Sanitary Sections and were composed of hospital corps men and of civilians hired by the quartermaster's department and turned over to the medical department for use as drivers, scavengers, etc. The functions of the Sanitary Sections were, under the direction of the commanding officers and medical officers, to carry out all sanitary measures for

the prevention of disease. They took entire charge of the disposal of excreta and wastes, the sterilization of water, the policing of latrines, anti-mosquito work, etc. In addition to these functions they constituted a personnel always at hand and available, for the correction, without delay, of the many minor sanitary defects which were continually arising in camp. Much interest was aroused by the new scheme and its operation was closely watched by both medical and line officers. At first there was some friction and criticism, as is usual with new departures, but soon the machinery was running smoothly, and the results attained in improved sanitary conditions, the relieving of the line and quartermaster's department of uncongenial work, and the placing of the responsibility on one department, removed practically all criticism. Never before in the history of the Army have such clean and well-kept camps been seen, and it is hoped that steps will be taken to make the new method a permanent feature of the military service in the field.

BOVINE TUBERCULOSIS.

According to the London dispatches, the British Royal Commission appointed to investigate the possible dangers of bovine tuberculosis to man has just made a report, confirmatory of a former opinion issued by it, that Koch's theory that bovine tuberculosis is not communicable to the human species is incorrect. They have found, they say, that milk containing bovine tubercle bacilli can by feeding produce tuberculosis in apes, and they have no doubt that many cases of human tuberculosis, especially in children, are due to this germ. This report is only what might be expected; the same conclusions had been reached by the United States Agricultural Department's investigators, but it is some advantage to have cumulative evidence as to this very important point. The importance of proper bacteriologic analyses of milk and the inspection of dairies can not be sufficiently emphasized, and it is very possible that while the milk of tuberculous cows may be comparatively innocuous to adults of fair resisting powers it may be extremely dangerous to young children and those having a predisposition to tuberculous infection. In fact, the milk is most likely to be far more dangerous than the meat of such animals, which, before being eaten, is usually sterilized in the process of cooking. Hence the greater necessity of stamping out tuberculosis in dairy herds.

THE ACTION OF THE X-RAYS ON LEUKEMIC BLOOD.

The use of the *x*-ray in leukemia was at first practiced on purely empirical grounds, as the method of action of the rays was little understood. Later, experimental and clinical work showed that the *x*-rays had a destructive power of a selective character, picking out certain varieties of cells and causing their solution. Now, Capps and Smith[1] have shown that the serum of a leukemic patient in whom such cell destruction has taken place, develops lytic power, also of a selective character, and that both within and outside of the body it is capable of causing solution of certain varieties of leucocytes. Not all leukemic patients develop this power in their serum, for not all of them improve under the *x*-ray, and the lytic properties seem to be proportional to their improvement. These observations are interesting and suggestive, and may pave the way for improvements in the *x*-ray treatment of leukemia.

1. Jour. of Exper. Med., January, 1907.

Medical News

ILLINOIS.

Violent Deaths Increase.—The report of the coroner of Cook County for January shows that his office investigated 385 deaths during the month. Of these 187 were due to violence. Railway accidents caused 36; falls, 24; suicide, 34; asphyxiation, 21; burns and scalds, 17; street car and wagon accidents, 16; homicides, 14; criminal operations, 8, and exposure, 3.

Medicine Bill.—Mr. Schermerhorn has introduced a bill in the House of Representatives, making it unlawful to sell proprietary medicines containing narcotics or poisons unless each package is labeled with the name and quantity of such drugs printed in large type. The penalty for violation is placed at fines of from $100 to $1,000, or 30 days to one year in jail, or both.

County Hospital Staff Reorganized.—It is reported that under the reorganization at Cook County Hospital, the staff will consist of 60 in place of 81, as in the past. Only one examination will be given, and those holding the highest marks will be given positions on the staff, irrespective of the school of medicine. This will also do away with the separate wards for the different schools of medicine, which has caused so much trouble in past years.

State Board Appropriations.—The appropriations asked for by the State Board of Charities for state institutions amount in all to $7,804,916. This includes $265,000 for the establishment of an epileptic village, and $150,000 for a state sanatorium for consumptives. The board also suggests that a new hospital be built to take the place of the present hospital at Menard, which is reported to be poorly ventilated, overcrowded and unsatisfactorily arranged.

County Society Endorses State Board.—At the meeting of the Macoupin County Medical Society, held January 22, resolutions were adopted that the society urge its representatives in the legislature to consider favorably and pass the recommendations of the State Board of Charities for an appropriation of $15,000 for the free distribution of diphtheritic antitoxin to the poor outside of Chicago; of $250,000 for the establishment of a farm or colony for epileptics; and of $150,000 for the establishment of a state sanatorium for the treatment of incipient tuberculosis and, furthermore, that insane, feebleminded and epileptic dependents become state charges, leaving to the county only the care of paupers.

Personal.—Dr. Edwin A. Weimer, Pekin, is reported to be dangerously ill at his home.——Dr. Harry G. Hardt, first assistant physician of the Illinois Northern Hospital for the Insane, Elgin, has been elected superintendent of the Illinois Asylum for Feeble-minded Children, Lincoln, vice Dr. Charles B. Taylor, resigned.——Dr. Austin E. Palmer, health physician of Morris, has resigned.——Dr. Samuel E. Munson, Springfield, has been elected president of the Brainard District Medical Society, to fill the unexpired term of Dr. William E. Guthrie, Bloomington, resigned.——Dr. St. Elmo M. Sala, Rock Island, is reported to be securely convalescent.——Dr. Paul G. Manley, Mount Carmel, for 28 years a practitioner of Wabash County, will soon leave for his ranch in Mexico, on account of ill health.

The Osteopathic Bill Again.—Senate bill No. 21, introduced by Senator Chafee, and House bill No. 66, introduced by Mr. Allen, are practically the same as the Senate bill of 1905, which was killed through the efforts of the medical profession and the State Board of Health. These bills just introduced would create a State Board of Osteopathic Examiners to examine and license osteopaths; would give to osteopaths practically all rights and privileges of licensed physicians and surgeons; would permit them to practice surgery, obstetrics and medicine; to prescribe and administer all drugs coming within the broad classification of antiseptics, antizymotics, paracitic-ides, intestinal antiseptics, general and local anesthetics, hyp-

notics, local and mydriatic anodynes, analgesics, antipyretics, emetics, laxatives, alteratives, cardiac stimulants, diaphoretics, respiratory stimulants, etc. The committee on medical legislation of the State Medical Society and the State Board of Health are opposing these bills on the ground that the public health, safety and welfare demand their non-enactment; and furthermore, because they are inimical to the rights and privileges of licensed physicians of Illinois, who have complied with the laws of the state. They make the request through THE JOURNAL that the members of the medical profession of Illinois express their views at once to their representatives in the forty-fifth General Assembly (both senators and representatives) on Senate bill No. 21 and House bill No. 66.

Chicago.

First Aid Association Concert.—A concert is to be given in Orchestra Hall, February 12. Mme. Ernestine Schumann-Heink, Mr. Bruno Steindel, Mr. Ferdinand Jaeger and Mlle. Rosa Zukowskaja, for the benefit of the American White Cross First Aid Association.

Chicago Tuberculosis Institute.—The heirs of the Spalding estate have made a gift of $20,000 in memory of Mrs. Jesse Spalding, to the Chicago Tuberculosis Institute, to be used as the directors see fit, in promoting the fight against the disease. The institute decided to have dispensaries in various congested districts of the city.

Deaths During the Week.—During the week ended February 2, 741 deaths were reported, or six more than for the preceding week and 84 more than for the corresponding week of 1906, the respective annual death rates being 18.33, 18.18 and 14.16 per 1,000. Pneumonia caused 157 deaths; consumption, 83; violence (including suicide), and scarlet fever, each 44; heart disease, 55; nephritis, 43; cancer and nervous diseases, each, 29; bronchitis, 20, and diphtheria, 15. The number of deaths from scarlet fever during the week was exactly double the number reported for the previous week.

January Deaths.—The highest death rate on record for January, with one exception, was reported this year. During the month 3,066 deaths from all causes were reported, equivalent to an annual death rate of 17.13 per 1,000, a rate more than 10 per cent. higher than the average. The increases and principal causes of death were as follows: Pneumonia, 592, an increase of 118 as compared with January, 1906; scarlet fever, 95, an increase of 67; heart disease, 235, an increase of 67; bronchitis, 91, an increase of 27; influenza, 51, an increase of 27; consumption, 326, an increase of 27; violence, 168, an increase of 25; diphtheria, 73, an increase of 18; measles, 26, an increase of 20; nervous diseases, 115, an increase of 10; convulsions, 61, an increase of 9, and nephritis, 212, an increase of 6.

Scarlet Fever and Diphtheria.—Dr. Heman Spalding, chief medical inspector, reports that during the week 292 cases of diphtheria were reported to the department of health, or six fewer than during the previous week. In the same time 1,686 cases of scarlet fever were reported, an increase of 681 cases over the preceding week, and 190 cases of measles, an increase of 51 over the preceding week. He considers that the agitation of the newspapers and the increased interest taken by the people in the matter of contagious diseases accounts in part for the increase in reported cases. The newly appointed medical inspectors in their visits to schools have uncovered a large number of cases unattended by physicians and unreported to the department. In numerous cases they have found school children recovering from mild attacks of scarlet fever, but still in condition to communicate the disease. Aside from these causes of increase there has, however, been a steady increase in the number of contagious diseases. For several months children with a mild form of scarlet fever, who were unattended by physicians, have been allowed the freedom of the streets, places of amusement and schools. Under these conditions multiplication of cases was a foregone conclusion, as has been pointed out repeatedly by the department of health. Three hundred and fifty medical inspectors of schools have now been appointed. This increased force will permit an inspector at every school, including the parochial schools, every morning. The finance committee has recommended the erection of a municipal hospital for the treatment of infectious diseases. This hospital is an absolute necessity, and the lack of it has long been a reproach to the city.

INDIANA.

Medical School Bill Defeated.—The Edwards bill, which authorized the Indiana University to build a medical school at Indianapolis, was defeated, without debate, in the House of Representatives, January 29, by a vote of 51 to 44.

State Board Election.—At the meeting of the State Board of Medical Examiners, held in Indianapolis, January 7, Dr. James M. Dinnen, Fort Wayne, was elected president; Dr. J. Edwin P. Holland, Bloomington, vice-president; Dr. Moses S. Canfield, Frankfort, treasurer, and Dr. William T. Gott, Crawfordsville, secretary (re-elected).

Society Election.—At the annual meeting of the Indianapolis Medical Society, January 8, the following officers were elected: Dr. Orange G. Pfaff, president; Dr. Alfred S. Jaeger, vice-president; Dr. Roscoe H. Ritter, secretary-treasurer; Drs. Alembert W. Brayton and David Ross, members of the judicial council, and Drs. Edmund D. Clark and Thomas B. Noble, delegates to the state medical society.

Epidemic Diseases.—An epidemic of scarlet fever is reported in and around Camden.——An outbreak of typhoid fever has occurred at Evansville, which is believed to be due to the flood in the Ohio River.——The board of health of South Bend reports that 109 cases of smallpox occurred in that city from Sept. 19, 1906, to January 1, and that 10 new cases were reported this year. Fifteen houses are now under quarantine. ——Scarlet fever is reported to be prevalent among the flood refugees at Aurora.

December Disease and Deaths.—During December bronchitis and tuberculosis were the most prevalent diseases. Pneumonia caused 408 deaths, or 61 more than in the corresponding month of 1905. Diphtheria was reported to be epidemic in 12 localities during the month. It was present in 50 counties, and 443 cases were reported, with 67 deaths. Only one death occurred from smallpox, although 493 cases were said to exist in 19 counties. Typhoid fever was reported from 50 counties. There were 439 cases, with 79 deaths. Tuberculosis is reported to have caused 329 deaths. The annual death rate of all cities was 15.7 per 1,000, and the county death rate was 11.6 per 1,000.

An Active Health Board.—The Indiana State Board of Health is doing yeoman work in the interest of pure food and drugs as shown by the monthly bulletin issued by the organization. Hundreds of analyses of foods and drugs have been made and the results tabulated, giving (what is most essential), the names of the various manufacturers, the brands and the degree, if any, of adulteration. The campaign has already borne fruit and sophistication is much less frequent than formerly. The board also prints in its bulletin an abstract of mortality statistics, with a summary of the morbidity and the mortality for the month. The division of bacteriology reports the number of microscopic examinations made for pathogenic bacteria, the number of Widal tests, etc. Altogether the state of Indiana is to be congratulated on its energetic and efficient health board.

Personal.—Dr. Robert Ansley, Indiana Harbor, has been ill with scarlet fever.——Dr. Charles S. Stewart, Auburn, has been reappointed special eye, ear, nose and throat surgeon for the Chicago division of the Baltimore & Ohio Railroad.——Dr. David G. Linvill, Columbia City, is reported to be critically ill.——Dr. Charles H. Eckert, Marion, has been appointed surgeon for the Indiana Union Traction Company, vice Dr. Aldin J. Dooley, deceased.——Dr. Harry Boyd-Snee, South Bend, has sailed for Europe.——Dr. Alpheus P. Buchman has been appointed a member of the Fort Wayne board of health, vice Dr. John W. McCausland, resigned.——Dr. James M. Larimore, Greenfield, has retired after 40 years' practice.——Dr. L. H. Conley, Gas City, has been appointed physician to the Grant County Infirmary.——Dr. Bert V. Chance, Windfall, has been appointed secretary of the local board of health.——Dr. Alpheus P. Buchman has been elected president, and Dr. Henry O. Bruggeman, secretary, of the Fort Wayne board of health. ——Dr. Charles E. Patrick, Indianapolis, is reported to be seriously ill with nephritis.——Dr. Perry Woolery, Heltonville, was seriously injured in a runaway accident, January 23.—— Dr. James A. Rawley, Brazil, was thrown from his buggy January 22 and slightly injured.——While attempting to cross a swollen creek, near Pike's Peak, Dr. Alfred J. Ralphy, New Bellsville, had a narrow escape from drowning. His buggy was overturned in the stream and his horses were drowned. ——Dr. Theo. M. Brenton has been appointed health officer of Osgood.——Dr. Joseph F. Deputy, Hackleman, who has been seriously ill, is reported to be slowly improving.

MARYLAND.

Smallpox.—Three cases of smallpox, all in children, and all in one family, are reported from Lansdowne. The disease was first diagnosed as measles.

Illegal Practitioner.—"Dr." J. F. Wagner, Hagerstown, was arrested January 30 on the charge of practicing medicine without a state license. In default of $300 bail he was committed to jail.

Fund for Prevention of Tuberculosis.—A movement has been inaugurated for raising $10,000 annually for the support of the Maryland Association for the Prevention and Relief of Tuberculosis. The money is to be used in education and prophylaxis.

Protest Against Quarantine.—Residents of Kent County have sent in a petition to the State Board of Health representing that the quarantine which has been enforced against them on account of the prevalence of smallpox, has caused great hardship, and scarcity of food, fuel and other necessities. They pledge themselves to coöperate with the board in eradicating infectious diseases, and the board has allowed steamboat service to be resumed.

Baltimore.

Health Report.—During the week ended February 2 there were 36 deaths from pneumonia and 5 from influenza. Measles is reported to be quite prevalent.

Memorial Tablet to Dr. Latimer.—A bronze memorial tablet has been erected in the infirmary of the Baltimore College of Dental Surgery by the senior class of that college in commemoration of the late professor, Thomas S. Latimer, M.D.

January Deaths.—To the unseasonable weather of January is believed to be due the increased mortality of 1,041, as compared with former years. The increase was chiefly in affections of the respiratory passages, influenza, bronchitis, tuberculosis, etc.

Registration of Tuberculosis.—Drs. Henry Barton Jacobs and William H. Thayer went to Washington, February 1, and appeared before the senate committee, to urge the registration of cases of tuberculosis. The committee is considering a bill requiring physicians of the District of Columbia to register such cases.

Personal.—Dr. Arthur M. Shipley, superintendent of the University of Maryland Hospital, has returned after four months abroad.——Dr. Daniel St. T. Jenifer has been appointed physician to the South & Western Railroad Company, and is located at construction camp No. 5, near Marion, N. C.——Dr. Henry M. Hurd, superintendent of the Johns Hopkins Hospital, returned to Baltimore from a trip in Cuba, Mexico and California, January 26, and after a few days left for Boston, where he took steamer for Naples.——Dr. Robert E. L. Campbell has returned from Japan and is now in New York City.

NEBRASKA.

Wintering in Florida.—Dr. Frederick D. Haldeman and family, Ord, are spending the winter in Florida.

Irregular Found Guilty.—A. J. White, who advertised himself as a "doctor of vitaopathy," was found guilty of practicing medicine without a license at Grand Island, January 9.

Infectious Diseases.—Typhoid fever, diphtheria and scarlet fever are reported from York.——The scarlet fever epidemic at Lincoln shows slight signs of abatement. On January 26, 82 cases were reported, as compared with an average of more than 100 for several days previous.

To Aid Carroll.—At a meeting of the Nebraska Academy of Medicine, held in Lincoln, January 10, a committee of five, consisting of Drs. Solon R. Towne, Omaha; Alexander S. von Mansfelde, Ashland, and Henry B. Ward, Robert H. Wolcott and H. Winnett Orr, Lincoln, was appointed to make an effort to obtain the Nobel prize for Dr. James Carroll, U. S. Army.

NEW YORK.

Coroner Harburg's Bill.—This measure, now before the legislature, provides that no superintendent of a hospital in the city of New York, or other person in authority, shall refuse admission to an applicant brought by ambulance or other conveyance to such hospital if the hospital has room for the patient, and if the patient has not a contagious disease. Nor shall any superintendent or other person in authority in any hospital order the removal of any patient while in a dangerously sick or precarious condition to another hospital. The penalty for violation of this law is a fine not to exceed $100.

Bright Outlook for Stonywold.—At the annual meeting of the managers of Stonywold Sanitarium for working girls afflicted with tuberculosis, it was announced that the $75,000 mortgage would probably be lifted by March 1, as John D. Rockefeller and Anson R. Flower had each promised $12,500, provided the rest of the money is raised by March 1. Smaller amounts have brought the sum in hand up to $40,000. The medical report showed that of the 113 patients discharged during the year 17 were apparently cured, 43 had the disease arrested, 32 were improved and 21 were not improved. The total income for the year was $111,463 and the expenditure $107,000.

Memorial to Dr. Alexander E. MacDonald.—Dr. C. M. Campbell, secretary of the New York Psychiatrical Society, reports that at a recent meeting a committee consisting of Drs. Carlos F. MacDonald and William Mabon presented a memorial notice of the death of Dr. Alexander E. MacDonald. The deceased had been actively in the care of the insane for many years, being medical superintendent of the New York City Asylum for the Insane from 1874 to 1904. He was one of the first to establish the tent treatment for the tuberculous insane. Dr. MacDonald had rare administrative qualities and was familiar with every detail in the care of the insane; seven thousand of these unfortunates at one time being under his direction.

Report on Tuberculosis Hospital.—According to the sixth annual report of the trustees handed to the senate, New York City, Buffalo and Albany furnish the bulk of the patients at the New York State Hospital for the Treatment of Incipient Pulmonary Tuberculosis, at Raybrook. There were 940 applications for admission during the year and 222 patients were admitted. More than 60 per cent. of those who have been in the hospital for two months or longer have apparently recovered, and more than 30 per cent. have been benefited. Superintendent Burnham says that incipient tuberculosis is practically unknown to the profession save to those actually engaged in special work along this line, and many cases are referred to this institution which are subsequently rejected because they are not in the incipient stage.

Buffalo.

Wants Separation of County Hospital and Almshouse.—Alderman Callahan recently offered a resolution in the board of aldermen asking for a separation of the County Hospital from the county almshouse.

Communicable Diseases.—The total deaths from scarlet fever in 1906 were 21, and total deaths from diphtheria in 1906, 64. In January 45 cases of scarlet fever were reported. At present there are 62 cases of scarlet fever, 56 cases of diphtheria and 765 cases of measles.

Hospitals Ask More Pay.—Eight hospitals have petitioned the board of aldermen for increased compensation for city patients. The hospitals now receive $5.00 a week *per capita*. They now ask $7.00 a week. The advance in the cost of necessities causing increased cost of maintenance was the principal argument advanced.

New Regulations Proposed for Health Department.—The charter revision committee, through its subcommittee, has drafted regulations governing the health department. The regulations provide that the health commissioner is to be appointed by the mayor (as he is now), and must be a reputable, licensed physician with actual experience in practice of not less than seven years. The commissioner is to appoint his assistants and, with the council's concurrence, shall fix their salaries. In time of "great and imminent peril to the public health," the commissioner of health may take such measures for safety as he deems necessary. As at present he will have supervision over dead bodies, and the registration of births, marriages and deaths. It is also provided that he shall make rules and regulations for enforcement of all laws and ordinances for the protection of public health and care of vital statistics. One section not only authorizes but requires him to prepare ordinances for licensing all persons offering to give massage and medicinal baths, and all persons and organizations advertising to practice medicine in any of its branches. He is further empowered to enforce all health ordinances and is given greater power over tenements than is provided for in the present charter. All drainage, plumbing, etc., in all kinds of buildings shall be subject to the commissioner's approval and if not prohibited by statute or law, the commissioner is empowered to permit or prohibit the building of dwellings to be used by more than two families, of livery stables, barns in which live stock is to be kept, slaughterhouses or rendering plants; or the transforming of present buildings into structures for any of such uses.

New York City.

Hospital Fund Mounts Up.—The Saturday and Sunday Hospital Association reports that the sum of $100,000 is assured. All additional contributions up to $110,000 will be duplicated.

Harvey Society Lecture.—The eighth lecture in the present course of Harvey Society lectures will be given at the Academy of Medicine, February 9, by Prof. George Huntington on "The Genetic Interpretation of the Variations in the Genitourinary Tract."

City Tuberculosis Dispensary.—The department of health

opened a new dispensary for the treatment of tuberculosis on February 4 at Third Avenue and St. Paul's Place. All who apply are examined, given free treatment and sent to the proper hospitals.

Contagious Diseases.—There were reported to the sanitary bureau for the week ended January 26, 420 cases of tuberculosis, with 197 deaths; 273 cases of diphtheria, with 34 deaths; 268 cases of scarlet fever, with 7 deaths; 181 cases of measles, with 6 deaths; 54 cases of whooping-cough, with 5 deaths; 35 cases of typhoid fever, with 9 deaths; 14 cases of cerebrospinal meningitis, with 14 deaths; 263 cases of varicella, and 2 cases of smallpox, a total of 1,410 cases and 272 deaths.

Additions to Sanitary Code.—The board of health has added two new sections to the sanitary code. The first reads that "no cocain, either alone or in combination with other substances, shall be sold at retail by any person in the city of New York except on the prescription of a physician." The second section is that "it shall be the duty of all persons having in their possession cans or other receptacles containing milk or cream, which are used in the transportation and delivery of milk and cream, to clean or cause them to be cleaned immediately on emptying; no person shall use or cause or allow to be used any such receptacles for any purpose whatsoever other than the holding of milk or cream, or receive or have in his possession any such receptacle so used, or which is unclean or in which milk or cream has been allowed to stand until offensive." This section was made necessary by the bad condition in which cans and bottles are returned to the farms.

OHIO.

Society Has Annual Meeting.—The East Side General Practitioners' Medical Society, an organization of physicians practicing east of Washington Avenue, Columbus, held its annual social session and banquet, January 10. The wives and friends of the members participated in the pleasures of the evening. Dr. G. M. Clouse, the retiring president, acted as toastmaster. President C. C. Ross delivered his inaugural address. Dr. E. A. Hamilton responded to "Professional Friendship." Dr. I. C. Edwards to "The Physician's Wife." Dr. S. M. Sherman to "Reminiscences," and Dr. S. O. Griffin to "Our Purposes and Needs." The work of the society for the year promises to be very successful.

PENNSYLVANIA.

Appointed on State Board.—Drs. J. Guy McCandless, Pittsburg, and James B. Walker, Philadelphia, have been appointed members of the Regular Board of Examiners, to take effect March 1.

Scranton Free from Typhoid.—The typhoid fever epidemic in Scranton is almost ended. Instructions have been issued that the patrolmen who have been acting as sanitary guards be sent back to their police duties. Two medical inspectors have been dismissed. The $5.000 voted by the councils as an emergency fund has been expended, and another appropriation for the same amount will be requested by the health board.

Hospital Notes.—The South Side Hospital, Pittsburg, is to be enlarged with two wings, at a cost of $200.000, by Mrs. Amelia N. S. Oliver and her children, in memory of the late James B. Oliver.——At the annual meeting of the St. Vincent's Hospital Association, Erie, the following medical staff was appointed: Consulting physicians, Drs. D. H. Strickland and J. E. Silliman; attending physicians and surgeons, Drs. F. A. Walsh, C. A. O'Dea, G. A. Reed, G. S. Ray, D. V. Reinoehl, John J. Bell, F. L. Hall, John W. Schmelter, Charles G. Strickland, Richard O. Miller, Elmer G. Weibel and Clarence Lefevre; eye department, Drs. O. M. Shreve and G. William Schlindwein; pathologist, Dr. Charles G. Strickland.

Trustees of Medical School in China Organize.—The trustees of the University of Pennsylvania's medical school in Canton, China, had their first meeting, and organized with George Wharton Pepper, president, Edward C. Wood, treasurer, and Dr. William Schultz, secretary. The other members of the board are: Samuel F. Huston, Dr. Charles H. Frazier, Dr. Rufus B. Scarlet, William A. McKinney of Philadelphia, Dr. Howard Kelly of Baltimore, and William Guggenheim of New York. The name by which the work will be known and under which it will be conducted is the University School in Canton. It is to be under the immediate supervision of a board of trustees appointed by the Christian Association of the University of Pennsylvania.

Philadelphia.

Jacobi in Philadelphia.—Dr. Abraham Jacobi, New York City, delivers a lecture on "Specialism and Specialists" at the Woman's Medical College of Pennsylvania, February 9, at 8 p. m., on the invitation of the "Students' Medical Society" of that college. Previous to the lecture Dr. Jacobi is entertained at dinner by the faculty of the college. Dr. Jacobi's wife, Mary Putnam Jacobi, was a distinguished alumna of the college.

Health Report.—Although the deaths from all causes and a number of contagious diseases reported to the bureau of health during the week ended February 2 show a decrease over those of last week, the figures are nevertheless abnormally high. Owing to the large number of typhoid fever cases since January 1—about 1,500—the deaths therefrom are increasing steadily, those for the past week reaching 42. Deaths from pneumonia and tuberculosis also continue to be unusually heavy. From all causes the number of deaths aggregated 620, a decrease of 31 from the number reported last week and an increase of 49 over the number reported in the corresponding period of last year. The chief causes of death were as follows: Typhoid fever, 42; influenza, 11; tuberculosis, 71; cancer, 20; apoplexy, 31; paralysis, 31; heart disease, 50; diseases of arteries, 11; pneumonia, 88, and Bright's disease, 36.

SOUTH DAKOTA.

Personal.—Dr. R. J. Straeten, Rapid City, has successfully passed the examination of the Navy board at Washington, D. C., and is home waiting for commission as assistant surgeon, U. S. N.

Illegal Practitioners.—F. J. Gilbert, M.D., Rapid City, is reported to have been tried in justice court in December, found guilty of practicing medicine without a license and fined $50. The case of Elliott, D. O., for practicing medicine without a license, it is said, was temporarily dismissed. Dr. A. Allen, Deadwood, member of the South Dakota State Board of Examiners, represented the board at these trials.—— P. J. Waldron, Rapid City, who is reported to have been tried before the State Board last September, on charges of drunkenness and unprofessional conduct, found guilty and license revoked, has appealed to the Circuit Court, and is now practicing pending the decision.——The case of "Dr." Brunning of Aberdeen, charged with practicing medicine without a license has been settled by the court directing a verdict of not guilty. Brunning calls himself a "chiropractic" and his arrest was caused last summer by the secretary of the State Board of Health.

WASHINGTON.

Society Elections.—The Snohomish County Medical Association has elected the following officers for the ensuing year: President, Dr. James Chisholm, Everett; vice-presidents, Drs. F. R. Hedges and P. L. Opsvig, Everett; and Dr. N. S. McCready, Snohomish; secretary-treasurer, Dr. J. S. Newcomb, Everett.——The annual meeting and dinner of the Pierce County Medical Society took place at Tacoma, January 9. The following officers were elected: President, Dr. G. D Shaver, Tacoma; vice-presidents, Drs. L. L. Love and S. Sargentich, Tacoma; secretary, Dr. A. de Y. Greene, Tacoma; treasurer, Dr. Wilmot De Leo Read, Tacoma.

GENERAL.

The Medical Society of the Missouri Valley.—The nineteenth semi-annual meeting of this society will be held at Omaha March 21-22, under the presidency of Dr. O. B. Campbell. A number of the presidents of the various state associations within the province of the society intend to present papers. The oration on medicine will be given by Dr. Robert T. Sloan, Kansas City, Mo., and the oration on surgery by Dr. Alexander Hugh Ferguson, Chicago. The local arrangements are in the hands of an able committee, with Dr. W. F. Milroy as chairman.

Medical Fraternity Meets.—The eleventh annual meeting of the Phi Chi fraternity was held in New Orleans, January 3 and 4, and the following officers were elected: Dr. Thomas S. Jones, Clinton, La., grand presiding senior; Dr. E. L. Brinson, Philadelphia, Pa., grand presiding junior; Dr. Fred L. Koontz, Louisville, editor-in-chief of the *Phi Chi Quarterly* (re-elected); Dr. H. W. Newman, Ann Arbor, Mich., associate editor; Dr. Alfred Henry, a member of the executive committee; Dr. Ebb C. Johnson, Chattanooga, Tenn., chief of the Delta Province. Dr. Rudolph Matas held a special clinic at the Charity Hospital in honor of the convention. Baltimore was decided on as the place for the next annual meeting.

Rockefeller Institute Scholarships.—The Rockefeller Institue for Medical Research announces a number of scholarships for work to be carried on in the laboratories of the institute in New York City, in experimental pathology, bacteriology, medical zoology, physiology and pharmacology, and physio-

logic and pathologic chemistry. They are open to men and women who are properly qualified and are granted for one year, the value ranging from $800 to $1,200 each. It is expected that holders will devote their entire time to research. Applications accompanied by proper credentials should be in the hands of Dr. L. Emmett Holt, secretary, 14 West Fifty-fifth Street, New York City, not later than April 1, 1907. The announcement of the appointments is made about May 15. The term of service begins preferably on October 1, but, by special arrangement, may be begun at another time.

CANADA.

Personal.—Dr. Charles W. Vipond, Montreal, has returned from a visit to Jamaica.——Dr. George R. McDonough, Toronto, has gone on an extended trip to Egypt.

Contagious Diseases.—Of 120 deaths in Winnipeg in January 30 were caused by pneumonia.——There were 62 cases of diphtheria and 50 of scarlet fever in Toronto during January.

Smallpox.—Rural districts in the counties of Peel, Lambton, Kent and Wellington, Ont., have centers of smallpox outbreaks. At Chatham, Ont., there have been 94 cases within the past few months, all of a mild character. There are six or seven cases in Toronto. The disease has also broken out in Reston, Man.

New Medical Association Formed.—The physicians of Oxford County, province of Ontario, have formed a medical association. Dr. Welford of Woodstock is president, and Dr. Rogers, Ingersoll, vice president; Dr. Brodie, Woodstock, is secretary; Drs. Joy, Tilsonburg; Williams, Ingersoll, and Adams, Embro are honorary presidents.

Hygienic Institution for London.—The Ontario government has decided to grant $50,000 toward the erection of a hygienic institute in the city of London and to give $5,000 per annum for its maintenance for five years. The city of London will give a free site for the institution and will also vote a sum equaling that of the government toward the cost of the building.

Hospital News.—Mr. George T. Tuckett, Hamilton, Ont., has donated $1,000 to the Hamilton Hospital for instruments and furniture for the operating room.——Mr. William Southam, Hamilton, Ont., offers to build a wing to the Hamilton City Hospital at a cost of $10,000, for the treatment of advanced cases of consumption, if the governors of the hospital will consent to take charge of it.——Mr. R. M. Boswell, Elora, Ont., has sent $150 to the Toronto General Hospital for the nervous disease wards recently established.

University News.—On January 15, Lord Grey, the governor-general of Canada, who is at present entertaining Secretary Root of the United States, addressed the Montreal Board of Trade on behalf of the endowment fund of McGill University. In view of the fact that Mr. Robert Reford, a prominent citizen of Montreal, has recently offered to contribute $50,000 toward an endowment of $1,000,000, a resolution was adopted calling on the citizens of Montreal to supplement the donation, as otherwise it will be impossible to carry on the affairs of the university so as to maintain its present efficiency and prestige.

FOREIGN.

Public Tuberculosis Sanatorium at Venice.—The city of Venice has set aside a comparatively large island, Isola Grazia, for a hospital and grounds for the tuberculous.

Plague in Australia.—According to the cable reports, there is a recrudescence of bubonic plague in Sydney, New South Wales. Eleven cases, two of which were fatal, have been reported since January 25.

Bubonic Plague at the Canary Islands.—Spain is alarmed at the presence of a few cases of bubonic plague on the Canary Islands. Energetic prophylactic measures have been enforced, under the direction of an expert sanitary officer dispatched at once to the spot.

For Cancer Research at Brussels.—A committee of prominent physicians and laymen has been appointed at Brussels to devise ways and means for organizing a cancer research institute and cancer dispensary similar to the *Fürsorgestelle* for cancer patients at Berlin.

German International Review for Surgical and Mechanical Orthopedics.—Hoffa and Vulpius have founded the *Centralblatt f. chirurgische und mechanische Orthopädie, Heilgymnastik und Massage*. The aim is to review the literature on these subjects, with abstracts of the important articles and occasional short original articles. S. Karger, Karlstrasse 15, Berlin, is the publisher, and the annual subscription, including postage, is 16.50 marks or about $4.15.

Mosquito Extermination in India.—The Calcutta municipality has taken steps toward destruction of mosquitoes. In some parts of the city the insects have been so numerous as to constitute a nuisance, which was repeatedly complained of by the inhabitants. The *Journal of Tropical Medicine* states that there is probably no large city in the world in which the problem of dealing with mosquitoes is more difficult. The whole city is honeycombed with tanks and excavations, while gardens are very numerous.

Semicentennial of the Leading Medical Journal of Holland.—A special number of the *Nederlandsch Tijdschrift voor Geneeskunde* is published this month to celebrate its fiftieth anniversary. It contains articles by Pel, Bruinsma, Tilanus, Korteweg and others describing the progress of the medical sciences during the last half century in Holland and the share of the periodical in this progress, and in raising the standard of medical instruction and professional ethics. The journal was founded by the merging of several small publications in 1857.

Appendicitis Conference at Berlin.—On the initiative of the secretary of the interior, a national representative conference to discuss the frequency of appendicitis was held recently at Berlin. The consensus of opinion seemed to be that the assumed increase in the number of cases of appendicitis in the last few years is only apparent. The question blank on the subject, to be sent to physicians, was mentioned in these columns recently. Physicians were urged to fill out the blanks with care. It was decided by the conference and the authorities that in future cases of appendicitis should be listed under a separate heading in death certificates and vital statistics.

Lack of Medical Assistants and "Sanitary Officers" in Germany.—The introduction of the "practical year" as a requirement after graduation in medicine has diminished the number of students who apply for the post of assistant in the clinics and institutes. Each clinic now needs more assistants than formerly, owing to the scientific tests, etc., deemed indispensable, while salaries have hitherto been low. The *Med. Klinik* raises a warning voice that unless scientific investigators are recruited from the best material, attracted by stipends or protection, the high standard of scientific research in Germany will begin to decline after a few years. The "sanitary officers" are subordinate army medical officers, and there are many vacancies in their ranks. This is the more surprising as the expenses of a military medical course are paid by the government, and an income is assured from the start, with great opportunities for advancement and for chairs in the universities. Among the scientists who commenced life as subordinate military medical officers are mentioned Virchow, von Leyden, Behring, Renvers, Goldscheider and Gaffky.

LONDON LETTER.

(From Our Regular Correspondent.)

LONDON, Jan. 19, 1907.

The Spread of Tropical Diseases.

Sir Patrick Manson, as guest at the dinner of the African Society, made an important pronouncement. Disease, he said, has more than any other cause made Africa a "dark continent." But for it Africa, instead of being to-day at the fag end in the race of civilization, would be in the van. Until eight or ten years ago our knowledge of African disease was of a most elementary and unsatisfactory character. At one time all African diseases were included under the one word "malaria." Now, since it has been studied scientifically, the African "malaria" has been found to include half a dozen diseases due to absolutely different causes and producing different results. Among others are blackwater fever, African fever and sleeping sickness. The last was formerly confined to certain districts on the West Coast, but has now crept into the Congo, passed through the great African forests to Lake Victoria Nyanza, devastated Uganda, and now threatens to extend to the upper waters of the Nile and Lake Tanganyika. There is no knowing, he said, whether it may not spread to Rhodesia and possibly to India, and throughout tropical Asia—a calamity to mankind too terrible to contemplate. It is of the utmost importance, therefore, that those responsible should take steps to guard against such a possibility before it is too late. Of late years the policy of the government in the matters of pecuniary assistance to scientific research had undergone considerable change. A more liberal spirit is now shown in connection with grants to the School of Tropical Medicine and similar institutions.

Pharmacology

THE DIGESTIVE IMPOSSIBILITIES.

The Fallacy of Combining Pepsin and Pancreatin—Advertisements Measured by Scientific Statements.

In THE JOURNAL last week, page 434, we published the official announcement of the Council on Pharmacy and Chemistry relative to the liquid mixtures on the market claimed to contain pepsin and pancreatin. We also commented on the matter editorially and printed the first installment (the second appears this week) of an article on the subject by Professor Sollmann. The evidence showing the absurdity of such mixtures, as already presented by the Council and in the article of Professor Sollmann, ought to be sufficient to convince any physician who will give the subject just one minute's thought. This week, however, we present further evidence in the form of quotations from text-books, a class of evidence which, while not always reliable, must be accepted as reliable in this instance, for the reason that it is capable of proof and has been proved. We inject these quotations into a partial list of the preparations on the market, leaving our readers to draw their own conclusions regarding the manufacture and the use of such impossible combinations.

The manufacturer's excuse, as stated last week, is that physicians demand such preparations, and that they are simply supplying the demand. Why do some physicians demand and use such preparations? The answer is easy: because, repeating again, they have depended on the literature of the manufacturer rather than on scientific literature and on text-books. The "literature" in the form of advertisements of Lactopeptin and Elixir of Lactopeptin probably is more responsible for the demand for these monstrosities than any other one thing. It has been said that more money has been spent in advertising Elixir Lactopeptin than has been spent for any other one proprietary preparation on the market. Probably this is true, if we take into account the liberality of the firm in this regard and the time the preparation has been on the market.

It must be remembered that trypsin—mentioned in some of the quotations—is one of the principal constituents of pancreatin.

NEW YORK PHARMACAL ASSOCIATION.

ELIXIR LACTOPEPTINE. "Contains the five active agents of digestion—pepsin, diastase (veg. ptyalin), pancreatin, lactic acid and hydrochloric acid—combined in the proper proportions to insure the best results."

["Useless Pepsin Compounds.—But let me warn you to place no faith in the pharmaceutic monstrosities which are said to contain pepsin combined with pancreatin, with which it is positively incompatible, nor those in which it is combined with wines or any preparation of alcohol which, except in the weakest dilutions, interfere with its action. . . . Pancreatin not only can not be combined in the same mixture with pepsin, since they mutually destroy each other, but it can not be prescribed with any benefit so long as pepsin and HCl are being secreted by the stomach." Boardman Reed, Diseases of Stomach and Intestine, page 347.]

SHARPE & DOHME.

PAN-PEPTIC ELIXIR. "An efficient tonic-digestive containing pure pepsin, pure pancreatin, pure caffein, lactic acid and celery, the latter being added chiefly for its flavoring properties."

ELIXIR PEPSIN AND PANCREATIN.

ELIXIR PEPSIN, BISMUTH AND PANCREATIN.

ELIXIR PEPSIN, STRYCHNIN, BISMUTH AND PANCREATIN.

["Pancreatin digests albuminoids and converts starch into sugar and proteids into peptones, also emulsifies fats in presence of an alkaline solution (pepsin requiring an acid one). Prolonged contact with mineral acids renders it inert. It is digested by pepsin, and hence probably never passes into the duodenum in its own character." Potter, Materia Medica and Therapeutics, tenth edition, page 373.]

H. K. MULFORD COMPANY.

ELIXIR LACTATED PEPSIN. "Contains pepsin, pancreatin, lactic acid, maltose, hydrochloric acid, etc."

LIQUOR DIASTOS. "Contains pepsin (isolated), diastase, trypsin, ptyalin, nitro-hydrochloric acid, C. P., nux vomica with aromatics."

["In the presence of an acid it (pancreatin) soon becomes inert." A. A. Stevens, Modern Materia Medica, 1903, page 176.]

["Attention is called to the fact that many ferments—especially trypsin—are destroyed by the pepsin. It is, therefore, very doubtful whether any ferment can be given which will act beyond the stomach." Sollmann, Text-Book of Pharmacology, page 749.]

PARKE DAVIS & CO.

ELIXIR PEPSIN, BISMUTH AND PANCREATIN. "Designed to cover the indications when both the stomach and the duodenum fail in functional activity—that is when there is both gastric and intestinal indigestion—with symptoms of catarrh in the regions named."

ELIXIR PEPSIN, BISMUTH, STRYCHNIN AND PANCREATIN. "Covers the same indications as the preceding, with the advantage of the tonic influence of strychnin."

ELIXIR PEPSIN AND PANCREATIN.

ELIXIR PEPSIN AND PANCREATIN WITH CAFFEIN.

MALT EXTRACT WITH PEPSIN AND PANCREATIN.

ELIXIR LACTATED PEPSIN. "A combination of pepsin, pancreatin, diastase, lactic acid and hydrochloric acid."

["Trypsin is gradually destroyed by gastric juice, and even by digestive hydrochloric acid." Hammarsten, Physiol. Chemistry, page 327.]

["Pancreatin and peptonized foods.—We must again point out that the value of these preparations depends on their being predigested foods, and it would be an error to suppose that in administering them we are introducing an active digestive ferment into the small intestine; for the proteolytic action of trypsin is arrested in an acid medium like the gastric juice, and the gastric pepsin aids in the destruction of the ferment." Yeo, Hare's System of Practical Therapeutics, vol. i, page 221.]

FREDERICK STEARNS & CO.

ELIXIR LACTINATED PEPSIN. "Few combinations of digestive ferments have given better satisfaction than this one. It contains pepsin, pancreatin, vera diastase, lactic acid, hydrochloric acid, sodium chlorid, and milk sugar, thus representing the various digestive fluids of the body."

ELIXIR PEPSIN, BISMUTH AND PANCREATIN.

ELIXIR PEPSIN AND PANCREATIN.

["Pepsin and pancreatin are incompatible in solution, for the reason that if the menstruum be of such acid nature as to preserve the pepsin, the pancreatic enzyme will in time be destroyed; while if it is neutral or feebly alkaline, the pepsin will be destroyed." B. T. Fairchild, Reference Handbook of Medical Sciences, vol. vi, page 556.]

ARTHUR PETERS & CO.

PETERS' PEPTIC ESSENCE COMP. "This valuable preparation contains pure pepsin, pure pancreatin, pure diastase, pure lactic acid, pure hydrochloric acid, pure glycerin, and aromatics." . . .

["It (pancreatin) may be given dry, in powder, capsules or compressed pills, or in solution. It should be administered in combination with an alkali, as the activity of pancreatin is destroyed by acids." Butler, Materia Medica and Therapeutics, fifth edition, page 499.]

WM. S. MERRELL CHEMICAL COMPANY.

ELIXIR ATONIC DYSPEPSIA, PHENOLATED. "Contains pepsin, pancreatin, cascara sagrada, ipecac, nux vomica, phenolated elixir."

MALT EXTRACT WITH PEPSIN AND PANCREATIN.

["Kühne made the observation that the activity of trypsin was permanently destroyed by digesting its solutions with pepsin and hydrochloric acid. . . . Meltzer finds that hydrochloric acid alone destroys trypsin, but not as rapidly as when pepsin is also present." Schaefer's Text-Book of Physiology, vol. i, page 337.]

WILLIAM R. WARNER & CO.

ELIXIR PEPSIN AND PANCREATIN.

LIQUID PANCREOPEPSIN. "Comprises the natural and assimilative principles of the digestive fluids of the stomach and duodenal tract, viz.: Pepsin, pancreatin, lactic and muriatic acids."

["This ferment (pancreatin) is completely destroyed in the gastric juice. This is why thinking practitioners should not use both pepsin and pancreatin together in the same solution, because the medium in which one must act is opposed to that of the other. In the majority of cases in which pancreatin is given empirically, HCl is still secreted in the stomach and the

ferment is destroyed." Hemmeter, Diseases of the Stomach, pages 345-6.]

SMITH, KLINE & FRENCH.

ELIXIR PEPSIN, BISMUTH AND PANCREATIN.
ELIXIR PEPSIN AND PANCREATIN.

["The value of pancreatin is even more problematical than that of pepsin, for though it would no doubt be valuable where the digestive ferments, particularly those of pancreas, were deficient, this has not been shown to occur. On the other hand, the pancreatic ferments are certainly destroyed in passing through the stomach." Cushny, Pharmacology and Therapeutics, on the Action of Drugs, page 710.]

COLUMBUS PHARMACAL COMPANY.

PEPTIC DIGESTANT. "Composed of pepsin, pancreatin, diastase, hydrochloric and lactic acids, combined with an aromatic vehicle."

["Pancreatin does not act in an acid medium and should not be given with acid." W. Gilman Thomson, Practical Medicine, 1900, page 403.]

LILLY & CO.

ELIXIR PEPSIN AND PANCREATIN.
ELIXIR PEPSIN, AND PANCREATIN COMPOUND.
ELIXIR PEPSIN, PANCREATIN AND BISMUTH.
ELIXIR PEPSIN, PANCREATIN, BISMUTH AND STRYCHNIN.
ELIXIR PEPSIN AND PANCREATIN WITH CAFFEIN.

["For action it (pancreatin) requires the presence of an alkali and in the acid gastric juice would not only not act, but would itself in all probability be digested and destroyed as a ferment; and it is of no value except for the preparation of predigested foods." H. C. Wood, Therapeutics, Its Principles and Practice, 1900, page 798.]

THE MALTINE COMPANY.

MALTINE WITH PEPSIN AND PANCREATIN. "Contains the three principal artificial digestants, diastase, pepsin and pancreatin, in such proportions as to be capable of converting all foods required by the human organism into the soluble condition necessary for proper assimilation."

["Hence it is obvious that pancreatic extracts or ferments given by the mouth can be of no value whatever, since the proteolytic ferment at least will undoubtedly be destroyed in the stomach before reaching its normal sphere of action." Chittenden, quoted by Yeo in Hare's System of Practical Therapeutics, vol. i, page 221.]

REED AND CARNRICK.

PEPTENZYME ELIXIR. Formula: "Enzymes of the peptic glands. . . . Enzymes of the pancreas. . . . Enzymes of the salivary glands. . . . Zymogens from the spleen. . . . Enzymes of the intestinal glands."

["Pancreatin, a mixture of the enzymes of the pancreas . . . does not act in an acid medium and is rapidly destroyed by the action of hydrochloric acid in the stomach." Croftan, Clinical Therapeutics, page 365.]

["Pepsin is incompatible with pancreatin, this in neutral or alkaline solution destroying pepsin, while in acid media being destroyed by the pepsin." Culbreth, Materia Medica and Pharmacology, 1906, page 655.]

The above is respectfully referred to the thoughtful consideration of the medical profession of the United States.

"Patent-Medicine" Advertising in the Religious Press.

Dr. F. M. Wood, Carlinville, Ill., writes: "I am glad that you are showing up the facts on the advertising in religious papers. It seems to me that nearly all our religious papers are guilty in this matter. The *Christian Herald* is the only one I have found that is practically clean. Even they print the Magic Foot Draft ad. I have written several times to the *Presbyterian* of Philadelphia, and to the *Christian Intelligencer* of the Dutch Reformed church (New York), urging the withdrawal of such ads as Mrs. Winslow's Soothing Syrup and Hood's Sarsaparilla, stating their content and, in the case of the former paper, I received no reply. The latter paper replied, stating that they regretted that it was necessary to take these ads, in order to continue the publication of the paper, since the amount obtained in subscriptions is in no way adequate to carry on the expense of publication. In this case I carried the matter to the Monmouth County classis of the synod of New Jersey, and they passed a resolution protesting against such advertising in their church paper and urging the synod of the church to take action. Thus far it went, and no further, and I was without any resource to carry it further. It seems to me that the only way to get at them is the one you are taking, and to keep urging every physician to call this matter to their attention. If there was a means of getting at their subscription list and cutting it down by reason of such work, that would solve the problem, but it seems as if the gullible public is glad to be fooled. I note that the *Herald and Presbyter* of Cincinnati also publishes these ads. A list of the religious papers who are guilty, printed in THE JOURNAL, would be a help in this matter."

If every physician who is subscribing for a religious journal that carries quack medicine advertisements would do as Dr. Wood has done, there would soon be an end to this co-partnership of the religious press in the Great American Fraud. Furthermore, if physicians would get their friends and patients to act also, they would help the cause along still more.

Analysis of Remedies for Kidney Diseases.

The *British Medical Journal*, Dec. 8, 1906, page 1645, gives the results of analysis of some of the chief proprietary remedies for kidney diseases. Several of these preparations are in the form of pills, while others are liquids.

The two principal drugs employed are oil of juniper and potassium nitrate, separately or together; in some cases aperients are added. Altogether extravagant claims are made for some of the articles, as is usual with proprietary medicines.

Analysis of Doan's Backache Kidney Pills gave results from which the following formula giving a similar pill was constructed:

Oil of juniper	1 drop.
Hemlock pitch	10 gr.
Potassium nitrate	5 gr.
Powdered fenugreek	17 gr.
Wheat flour	4 gr.
Maize starch	2 gr.

Divide in twenty pills.

Forty pills and four dinner pills sell for 2 shillings and 9 pence (66 cents); the estimated cost is one halfpenny (one cent).

The dinner pills were found to have approximately the following composition:

Oil of peppermint	1 drop.
Podophyllin	3.8 gr.
Aloin	6.9 gr.
Jalap resin	0.8 gr.
Powdered capsicum	0.5 gr.
Powdered licorice	0.6 gr.
Maize starch	0.5 gr.
Acacia gum	1.5 gr.
Extract of henbane	1.5 gr.

Divide in twenty pills.

Dodd's Kidney Pills, which are advertised as the "only remedy that has cured Bright's disease," were found to consist of extract of cascarilla, jalap resin, hard soap, potassium nitrate, sodium bicarbonate, hard paraffin, turmeric, and wheat flour. Var's American Kidney Pills are similar to Doan's, containing also oil of peppermint and powdered squill and extract of henbane. Fitch's Kidney and Liver Cooler, a liquid preparation, was found by the analyst to consist simply of a solution of potassium nitrate in water, 56 grains to the ounce—that is, 14 grains in a dose. The estimated cost of a bottle, containing rather under 4 ounces and selling for 2 shillings (48 cents), is one-eighth of a penny (¼ cent).

Board of Trustees of the U. S. P. Convention.

The 1900 Convention for the Revision of the United States Pharmacopeia adopted a constitution and by-laws providing for a board of trustees which has "the management and control of the affairs and funds of the convention." The board consists of five elected members, with the president of the convention and the chairman of the Committee on Revision, as ex-officio members. The members originally elected were: William S. Thompson, Washington, D. C.; Dr. George W. Sloan, Indianapolis; Charles E. Dohme, Baltimore; Albert E. Ebert, Chicago, and S. A. D. Sheppard, Boston; with Dr. H. C. Wood, president of the convention, and Dr. Charles Rice, chairman of the Committee on Revision, as ex-officio members. Deaths have made several changes in the board. Dr. Charles Rice died May 13, 1901, and Joseph P. Remington was made chairman of the Committee on Revision and thus became an ex-officio member of the board. William S. Thomp-

son died Sept. 26, 1901, and Dr. James H. Beal of Scio, Ohio, was elected October 21 to fill the vacancy. Dr. George W. Sloan died Feb. 15, 1903, and Dr. Henry M. Whelpley was elected April 14, to fill the vacancy. Albert E. Ebert died November 20, and F. W. Meissner, La Porte, Ind., has just been elected to fill the vacancy. Dr. Murray Galt Motter, Washington, D. C., was selected by the board in 1900 as secretary, which position he retains to the present time. The next meeting of the board will probably be the annual meeting, which is likely to be held in St. Louis early in May.

More Deaths from Soothing Syrups.

Dr. John E. Campbell, South St. Paul, Minn., reports the death of a child aged 10 months from the effects of Mrs. Winslow's soothing syrup, administered by the parents for restlessness.

Dr. Thomas C. Buxton, Decatur, Ill., coroner of Macon County, reports the death of a child from the effects of Rex cough syrup. An inquest was held and the following verdict was rendered: "The aforesaid child came to its death from an accumulation of cough syrup administered for the croup and a cold." Dr. Buxton states that the child had a cold and that it died from poisoning.

Dr. J. Elliott Dorn, Brooklyn, reports the death of a child from the effects of the administration of Monell's teething syrup. He states that the baby had been extremely cross and three drops of the preparation were administered, followed in one hour by 10 drops more.

Kopp's Baby's Friend Still Deadly.

The twin children of Joseph Minolich of Newcastle, Pa., died as the result of an overdose of some "patent medicine." Dr. Jesse R. Cooper, New Castle, to whom we wrote for information, reports as follows:

> The family were very reticent in giving me any particulars, as Mr. Minolich sells the preparation. I finally found the physician who attended the children and obtained the information. The name of the medicine is Kopp's Baby's Friend. The parents gave it according to the directions accompanying the bottle: 6 drops every 2 or 3 hours to keep the infant from crying. The children were not sick; they lived about one day after beginning to take the medicine. When Dr. Warner, the attending physician, saw them they were in the last stages of opium poisoning. They had not been given any other medicine. The children were six weeks old.

Correspondence

Alcohol in Official Preparations.

ST. LOUIS, Feb. 4, 1907.

To the Editor:—When the question of the mutual relations of the professions of the physician and of the pharmacist was first agitated here last October, at a meeting of the Medical Society of the City Hospital Alumni, which was reported in THE JOURNAL, Nov. 10, 1906, page 1584, a strong presentation of reasons was made by an eminent pharmacist in favor of physicians prescribing the preparations recognized by the United States Pharmacopeia and the National Formulary, these being recommended in the place of proprietary products, and an exhibition was made of a number of such preparations elixirs, syrups, etc.—all being attractive to the eye, and some to the senses of smell and taste as well.

As a medical student, I had been taught perhaps as much or as little in pharmacy as the average beginner, but, whatever the instruction was in amount, it had been nearly obliterated and, while listening to the pleas advanced, in which attention was called in particular to the samples of elixirs, I was compelled to ask my neighbors, doubtingly, how much alcohol was contained in such preparations, and could get no exact information on this point from well-educated physicians, until at last the, to me, surprising disclosure was made that a mere vehicle, such as elixir aromaticum, contains more than 25 per cent. of alcohol.

Since that meeting I have possessed what I never owned before, namely, a copy of the United States Pharmacopeia, and I have given it some attention, with interesting results.

To illustrate, I have found from a study of the formulas given there that a considerable amount of figuring is required to ascertain the alcoholic strength of certain preparations. For example, take that of the elixir before mentioned: First, the alcoholic strength of compound spirit of orange (over 70 per cent. ?) must first be calculated, and to this must be added the 291 + parts of alcohol required to make 1,000 parts, and from these results the problem may then be solved.

But why should a physician be required to make such calculations in order to know just what he is giving in the guise of a harmless vehicle intended to make acceptable that which is presumed to be either more potent or less palatable?

And this leads to the suggestion that it is incumbent on the medical profession to ask, first, that the Pharmacopeia shall state in plain terms the alcoholic strength of every preparation containing spirits in appreciable amount; and, second, that a requirement be made on pharmacists for something that will suitably and harmlessly replace alcohol in what is termed a vehicle—a definition of which is: "any inert substance that serves as a medium for taking drugs or medicines, an excipient."

Can any substance that contains 25 per cent. and more of alcohol be termed therapeutically inert, in good conscience? It is my dissent from such a proposition that prompts the representation now made, for I am satisfied from observation and reflection that not merely possibilities but actualities of much harmfulness attend the condition above pointed out.

GEORGE HOMAN, M.D.

A Course in Medical Economics.

CHICAGO, Jan. 25, 1906.

To the Editor:—In THE JOURNAL, Jan. 19, 1907, pages 228 and 246, I saw an editorial and a report on the value of a course in medical economics. I think it is a fine idea and hope it may be pressed so that all the schools may institute such a course. I may suggest, however, that there is no compact literature on the subject, and I doubt very much whether in any college a man can be found capable of giving a connected course on the various subjects embraced in the recommendation of the House of Delegates. A literature ought to be made and this would require many contributions from many people. I think that if a section on this subject could be established in the American Medical Association, it might bring out the best information of the profession and individual ideas would, from the discussion, receive such modification as necessary to adapt them to the needs of the profession at large. It would not be so very difficult for a person to give instruction in medical ethics. Some could give some instruction in finance, but nearly every one would have some ideas that he believed feasible that would not work for the majority of the profession. I hope you may devise some way to have this carried out systematically.

E. FLETCHER INGALS.

Society Proceedings

COMING MEETINGS.

Assn. of American Med. Colleges, Richmond, Va., March 18, 1907.
Medical Society of Missouri Valley, Omaha, Neb., March 21-22, 1907.

MEDICAL SOCIETY OF THE STATE OF NEW YORK.

One Hundred and First Annual Meeting, held in Albany, Jan. 28-30, 1907.

The President, Dr. JOSEPH D. BRYANT, in the Chair.

(*Continued from pages 426 and 429.*)

Danger Signals from the Skin.

DR. L. DUNCAN BULKLEY, New York, read a paper on the above subject which will appear in THE JOURNAL.

The Importance to Healthy Individuals of Periodic Aural Examination with Functional Tests.

DR. W. SOHIER BRYANT, New York, said that inasmuch as serious damage to the ears may take place due to insidious affections without the knowledge of the patient it is important that periodic examinations be made at all ages, especially after any general disease or affection of the upper air tract. In many instances by the time the patient becomes

aware of the existence of disease pathologic changes have advanced so far that recovery becomes very difficult, whereas the early detection of disturbance gives time for adequate treatment. Aural vertigo, tinnitus, deafness, danger of systematic infection and intracranial lesions from middle ear suppuration may frequently be prevented by expectant treatment.

DISCUSSION.

DR. BUSBY ALLEN, New York, thought also that deafness can easily be prevented if parents test the hearing of children with a watch occasionally. The prevention of deafness would be a large asset to the state.

DR. E. EDWARD DAVIS, New York, thought that where a hereditary tendency to deafness exists the ears should be tested every two years.

Practical Legislation for the Prevention of Blindness from Ophthalmia Neonatorum.

DR. F. PARK LEWIS, Buffalo, said that there is no discussion among scientific medical societies in regard to the statement that ophthalmia neonatorum is dependent on an infection and, also, that it is almost absolutely preventable either by keeping the cocci from entering the eyes of the new-born child or by using some germicide that will destroy their virulence before they have time to propagate. Several well-known measures are effective. Infection is less frequent and less disastrous in the hands of hospital obstetricians and others than formerly, but he thought that ophthalmia is quite as common as ever among careless practitioners and midwives, and that no protection whatever is afforded the child in such cases, and hence there should be some legal measure that would offer protection. He advised bills in the legislatures of the several states providing registration of births with boards of health; gratuitous distribution by the board of light-proof, sealed ampoules containing the selected germicide to all obstetricians, midwives and others making application for them; instruction of all such persons as to possibility of ophthalmia; measures of protection and necessity for immediate treatment; a requirement that on each birth certificate there shall be a signed statement that the germicide provided by the board of health or some other accepted prophylactic has been used in each eye of the child on the day of birth; a penalty in case the child lose the sight of one or both eyes when the statement is not made that the measures of protection recommended have been taken. He asked the endorsement of the society as to the propriety of enacting such laws.

DISCUSSION.

DR. PETER A. CALLAN, New York, said that the necessity for such a paper is a sad commentary on the indifference of the profession. A society for the prevention of blindness ought to be established in New York City, with branches in all the large cities.

DR. L. BOLTON BANGS, New York, said that while he approves of compelling obstetricians and midwives to make use of prophylaxis, educational propaganda will reach the source of infection. The matter brings in the social and economic questions with which the society should concern itself.

A Plea for New Methods in the Prevention of Blindness.

DR. LUCIEN HOWE, Buffalo, showed that ophthalmia of infancy is the most important cause of blindness and how much it costs both this state and the United States to care for this class of unfortunates. The best preventive thus far obtained for this affection is a 2 per cent. solution of silver nitrate. Other compounds of silver have recently been furnished, some of which are said to have advantages over the nitrate of silver and not to possess the disadvantages. There is much ignorance in regard to these compounds and some of them are no doubt greatly overestimated as germicides. He thought the obstetrician and not the oculist must decide on the relative value of these drugs as prophylactics. He urged obstetricians to experiment with these various compounds of silver in a large series of cases at large hospitals to decide this point.

The Physiologic Therapy of Sanitarium Treatments.

DR. P. O. KINNEAR, Clifton Springs, described a modern sanitarium and named the diseases most frequently met there. He showed how sanitarium methods in the treatment of chronic diseases possess advantages over those employed in cities. He also cited illustrative cases, telling why the successful results were obtained, and called attention to the importance of special study of the sympathetic nervous system in this connection.

(To be continued.)

Association News

NEW MEMBERS.

List of new members of the American Medical Association for the month of January, 1907:

ALABAMA.

Chamblee, Z. B., N. Birmingham.
Ford, W. F., Hoke's Bluff.
Jackson, L. F., Blossburg.
Leach, Sydney, Tuscaloosa.
Little, E. G., Birmingham.
McCallum, E. P., Greensboro.
Mitchell, H. Eugene, Birmingham.
Nice, C. McK., Palos.
Ransom, W. W., Birmingham.
Schoolar, T. E., Centerville.
Wilson, E. A., Birmingham.

ARIZONA.

Brown, O. S., Winslow.
Hickman, A. R., Douglas.
Sampson, G. P., Winslow.
Swetnam, J. M., Phoenix.

ARKANSAS.

Beard, J. H., Gentry.
Childers, J. M., Wattensaw.
Crigler, J. R., Biggers.
Eubanks, F. G., Decatur.
Hawkins, J. T., Mt. Holly.
Willson, E. L., Fowler.
Worsham, M. A., Centerville.

CALIFORNIA.

Cochran, Guy, Los Angeles.
Connolly, T. W., San Francisco.
Dangerfield, Arthur, North San Juan.
Gould, E. T., Sonora.
Gregory, F. S., Black Diamond.
Tebbe, F. H., Weed.
Tickell, A. H., Nevada City.

COLORADO.

Lamberton, R. F., Denver.
Middelkamp, Marion S., Pueblo.
Russell, C. W., Monte Vista.
Stoddard, T. A., Pueblo.
Swartz, C. M., Pueblo.

CONNECTICUT.

Coe, Anton, New Haven.
Moser, O. A., Rocky Hill.
Stockwell, W. M., Suffield.

DISTRICT OF COLUMBIA.

Souter, W. N., Washington.
Yates, Frederick, Washington.

FLORIDA.

Stringer, Sheldon, Tampa.

GEORGIA.

Barfield, F. G., Cuthbert.
Combs, J. A., Locust Grove.
Cooke, W. L., Columbus.
Quillian, H. P., Winder.

ILLINOIS.

Absher, A. A., Sibley.
Adderly, H. C., Chester.
Baker, Nellie M., Urbana.
Beilstein, F. W., Chicago.
Besley, F. A., Chicago.
Bisson, M. W., Abingdon.
Bisson, W. C., Abingdon.
Bohannan, H. R., Jerseyville.
Buecking, E. F., Chicago.
Burkett, Susie L., Chicago.
Caron, T. E., Kankakee.
Church, E. E., Lafayette.
Clark, C. C., Chicago.
Cole, C. E., Jacksonville.
Conroy, T. Frank, Chicago.
Dillon, William, Urbana.
Eskridge, Belle C., Chicago.
Gale, A. Ernest, Chicago.
Goetzinger, C. F., Chicago.
Heinzmann, C. B., Metamora.
Hyde, Katherine D., Chicago.
Kelley, T. H., Chicago.
Kuntz, W. W., Kinderhook.
Langhorst, H. F., Elmhurst.
Lawson, J. M., Sidney.
Leslie, J. F., Maunie.
Linder, L. J., East St. Louis.
Mackey, A. N., Chicago.
Manning, E. T., Prairie City.
Marshall, F. D., Chicago.
McGee, J. A., Virginia.
Metcalf, H. S., Mt. Carroll.
O'Connor, J. L., Chicago.
Pendleton, F. M., Quincy.
Portuondo, B. H., Belleville.
Rayhill, C. G., Belleville.
Reis, G. W., Chicago.
Rettig, F. A., Chicago.
Rutherford, Leslie, Peoria.
Schultz, Louis, Chicago.
Smith, L. J., Chester.
Smith, W. E., Grand Ridge.
Spencer, O. B., Kankakee.
Van Wormer, W. W., Girard.

INDIANA.

Boston, C. H., Bradford.
Buck, D. A., La Porte.
Famulener, L. W., Bloomington.
Fox, M. G., Indianapolis.
Hill, F. E., Muncie.
Mann, E. B., Muncie.
Marshall, G. D., Young America.
Moore, Wm., New Albany.
O'Neill, T. J., Anderson.
Ruby, F. McK., Union City.
Wagner, S. C., Wakarusa.

INDIAN TERRITORY.

Somerville, O. S., Bartlesville.
Wilson, McClellan, South McAlester.
Wyatt, M. Clay, Bartlesville.

IOWA.

Augustine, J. L., Ladora.
Battey, F. H., West Liberty.
Beach, A. E., Carroll.
Bell, J. F., Lucas.
Beauchamp, J. W., Bedford.
Brown, H. V., Griswold.
Bussey, W. J., Sioux City.
Comb, L. A., Fremont.
English, H. H., Conesville.
Fitzpatrick, D. F., Iowa City.
Fulliam, J. D., Muscatine.
Hall, C. H., Cherokee.
Hallinan, E. L., Clinton.
Heaton, E. D., Centerville.
Jay, D. A., Eldon.
King, O. W., Keystone.
Leytze, F. C., Sioux City.
Limbocker, E. R., New Virginia.
Lonsdale, James, Dale.
Luke, Edward, Coin.
Martindale, E. L., Clinton.
Matson, J. A., Kiron.
Morton, W. G., Marshalltown.
Oggel, H. D., Maurice.
Paisley, C. L., Farmington.
Pope, G. C., Ottumwa.
Rendleman, W. H., Davenport.
Riordan, M. F., Melrose.
Scroggs, J. P., Lenox.
Sherman, A. W., Burlington.
Smith, E. E., Sioux Rapids.
Sproule, E. W., Petersen.
Stephenson, R. B., Libertyville.
Vinson, H. W., Millersburg.
Walker, J. C., Boone.
Weston, B. F., Mason City.

KANSAS.

Brethouwer, C. G., Norton.
Brown, C. E., Leavenworth.

Edgerton, H. W., Canton.
Gard, J. F., Cherryvale.
Hale, T. H., Fall River.
Henderson, R. C., Erie.
Hoover, C. F., Saffordville.
Jones, J. B., Garnett.
Mable, L. D., Kansas City.
Mahan, H. P., Parsons.
McBride, J. S., Lyons.
Menard, C. E., Paxico.
Miller, W. S., Unlontown.
Moore, J. M., Madison.
Morgan, G. W., Kimball.
Palmer, W. R., Kansas City.
Pitts, E. P., Atchison.
Rakestrow, H. E., Chanute.
Schoonover, George, Garnett.
Seacat, G. M., Cherryvale.
Shaw, J. Cook, Holton.
Snyder, Z. H., Greenleaf.
Stockton, M. L., Gridley.
Stough, J. H., Arkansas City.
Tanquary, E. D., Independence.
Tanquary, Mamie J., Independence.
Trowbridge, W. C., Howard.
Vail, G. N., Parker.
Vaughn, C. K., Leavenworth.
Winegar, J. M., Hamilton.
Wood, H. L., Whitewater.
Youngs, W. E., Cherryvale.

KENTUCKY.

Bayless, B. W., Anchorage.
Flanagan, W. G. D., Jamestown.
Heizer, W. Lucien, New Haven.
Johnson, E. Y., Louisville.
Turner, E. D., Cave City.
Wilson, B. C., Clarkson.

LOUISIANA.

Bremer, B. F., Long Leaf.
Pratt, J. B., Natchitoches.
Roberts, S. T., De Ridder.

MAINE.

Chapman, H. M., Bangor.

MARYLAND.

Bratton, Howard, Elkton.
Goldbach, L. J., Baltimore.
Griffith, Timothy, Frostburg.

MASSACHUSETTS.

Abbott, H. E., Lynn.
Bannon, J. H., Lawrence.
Bartlett, P. C., Danvers.
Frothingham, Channing, Jr., Boston
Harlow, C. W., Melrose Highlands.
Henry, J. G., Winchendon.
Jones, C. D., Malden.
MacKenzie, L. F., Wellfleet.
McGrath, B. F., Beverly.
Phippen, W. G., Salem.
Potter, P. S., North Adams.
Roberts, L. A., Dorchester.
Safford, W. P., Brockton.
Stetson, F. W., Boston.
Stevenson, W. M., Cambridge.
Sweetser, F. E., Merrimac.
Swift, H. M., Hathorne.

MICHIGAN.

Christenson, J. A., Manistee.
Denslow, J. F., Muskegon.
Frenzel, Otto, Pigeon.
Luton, F. E. Kilmanagh.
Miller, R. E., Lansing.
Mitchell, James, Gladstone.
Rooks, J. J., Grand Rapids.
Whitney, Oat., Jasper.
Wicks, O. C., Muskegon.

MINNESOTA.

Baker, A. L., Kasson.
Beckley, F. L., Merriam Park.
Boxell, E. C., St. Paul.
Cady, Charles W., Mabel.
Campbell, J. E., South St. Paul.
Cooper, D. J., Dent.
Frost, E. H., Willmar.
Hegge, C. A., Austin.
Hoidale, A. D., Tracy.
McLaughlin, W. E., Willmar.
Sherman, C. L., Luverne.
Stevens, R. G., Heron Lake.

MISSISSIPPI.

Keyes, C. T., Tupelo.
Molloy, D. M., Caledonia.
Odeneal, E. P., Greenville.
Winchester, Sprague, Natchez.

MISSOURI.

Anderson, G. M., Pleasant Hill.
Anthony, C. A., Fredericktown.
Armour, W. A., Kansas City.
Austene, C. W., Centralia.
Baker, C. M., Santa Fe.
Barnes, F. M., Brashear.
Beaty, J. G., Huntingdale.
Bles, V. A., St. Louis.
Braecklein, W. A., Higginsville.
Bramel, H. W., McGirk.
Brewington, G. F., Bevier.
Britts, J. H., Clinton.
Bronaugh, J. H., Calhoun.
Brossard, P. M., Maplewood.
Brown, J. C., Lewistown.
Brown, W. G., Triplett.
Burgwin, A. B., Fayette.
Campbell, Givin, St. Louis.
Carter, W. C., Dixon.
Christian, C. H., New Bloomfield.
Cole, P. F., Steffensville.
Cook, G. E., St. Louis.
Corley, H. N., St. Paul.
Cottingham, I. A., Aurora.
Davis, J. S., Whiting.
Dewey, C. O., Breckenridge.
Donaldson, G. H., Kansas City.
Douglas, J. H., Dexter.
Dunigan, J. P., Sullivan.
Dusenbury, C. T., Monett.
Duwelins, L. H., Briscoe.
Eskew, De Witt, Poplar Bluff.
Evans, R. L., Boonville.
Fair, S. W., Belton.
Forgrave, L. R., St. Joseph.
Frame, C. N., Ewing.
Freund, N. M., St. Louis.
Gatley, V. A., Grant City.
Gordon, David, Chillicothe.
Gray, L. L., St. John.
Gunn, A. J., Versailles.
Hasse, Freeman, Revere.
Haley, O., Fredericktown.
Haney, T. L., Flat River.
Harwood, W. S., Rensselaer.
Hawkins, G. W., Triplett.
Hawkins, W. R., Glasgow.
Head, C. W., Windsor.
Hemker, W. H., Catawissa.
Hendrix, W. G., New London.
Hermann, H. W., St. Louis.
Huffman, D. M., Crane.
Hume, E. L., Bourbon.
Humphrey, H. M., Locust Hill.
Islaub, J. W., St. Joseph.
Jerard, Harold, Pleasant Hill.
Jones, H. S., Kansas City.
Jurgens, H. J., Edina.
Keeling, F. V., Elsberry.
Kerr, W. B., Dudley.
Knight, G. P., Benjamin.
Landis, H. B., Kings City.
Leonard, W. H., Kansas City.
Lewis, C. O., Fayette.
Lewis, N. O., Kansas City.
Lockwood, W. A., Conway.
Lofton, E. Ambrose, Laddonia.
Love, J. G., Nevada.
Manning, D. F., Marshall.
Marshall, Albert, Bonne Terre.
Mason, L. O., Bevier.
Mayes, J. F., St. Louis.
McCallister, W. A., Centralia.
McCormick, E. C., Farmington.
McNeil, C. A., Sedalia.
McNutt, W. R. A., Monroe City.
Meng, E. R., St. Louis.
Milem, J. A., Sikeston.
Moore, M. H., Dearborn.
Morley, F. R., Sedalia.
Mueller, G. L., St. Louis.
Musgrove, W. H., Wheeling.
Nieweg, J. W., Lois.
Norris, W. A., Columbia.
O'Connor, W. F., Baring.
Park, G. M., St. Louis.
Parkhurst, C. L., Odessa.
Parsons, Wm., Greencastle.
Paul, T. M., St. Joseph.
Platt, K. S., Chillicothe.
Porterfield, Elmo, St. Louis.
Powell, C. E., Elsberry.
Radmaches, J. J., Meta.
Rambo, J. H., Glenwood.
Rice, J. T., Excelsior Springs.
Reece, W. C., Elvins.
Reid, E. W., Humphreys.
McReynolds, U. R., Knox City.
Rootes, G. F., Tebbetts.
Rudd, W. E., Salem.
Rusk, E. McD., Villa Ridge.
Russell, R. Lee., Humansville.
Schofield L. J., Warrensburg.
Shacklett, J. A., Rutledge.
Shanks, E. O., Canton.
Sheetz, Robert, Orrick.
Shriver, C. F., Harris.
Slaughter, S. C., Fredericktown.
Slayden, J. L., Dexter.
Smith, B. H., St. Joseph.
Smith, O. A., Farmington.
Smith, U. S., Hannibal.
Snow, A. E., Union.
Sparling, G. A., Kirksville.
Swope, W. L., Wheeling.
Thompson, L. M., Macon.
Thornton, J. E., Columbia.
Todd, Luther A., St. Joseph.
Tomlinson, T. E., Morley.
Tracy, L. E., Chillicothe.
Trumpour, R. H., Spring Bluff.
Vandiver, C. E., Hannibal.
Waldo, E. E., Hannibal.
Walker, H. L., St. Joseph.
Walter, Frederick, Perry.
Weinsberg, Charles, St. Louis.
Wescoat, W. H., Oran.
West, Samuel, Idalia.
Wilkerson, J. O., Cowgill.
Williams, G. B., Flat River.
Wilson, R. E., La Belle.
Wysong, W. L., Missouri City.

NEBRASKA.

Bohannan, C. L., Elmwood.
Van Fleet, E. A., Omaha.

NEW HAMPSHIRE.

Pratte, A. A., Keene.

NEW JERSEY.

Asher, Maurice, Newark.
Banker, P. A., Elizabeth.
Duffield, E. M., Glassboro.
Harreys, C. W., Ridgewood.
Livengood, T. F., Elizabeth.
Nelson, A., Jersey City.
Ward, W. J., Newark.

NEW MEXICO.

Schermann, A. H., Pinos Altos.

NEW YORK.

Armstrong, S. T., New York City.
Babbitt, O. H., Auburn.
Baker, R. L., Utica.
Bedell, A. J., Albany.
Bentz, G. V., New York City.
Bierhoff, Frederic, New York City.
Bigelow, J. M., Albany.
Butler, C. S., Harpersville.
Chapman, Milton, Rochester.
Coon, C. E., Syracuse.
Cooper, W. G., Ogdensburg.
Culler, F. W., New York City.
Dalphin, P. F., Malone.
Drake, J. B., Norwich.
Dyer, F. M., Binghamton.
Faust, W. P., Schenectady.
Fisher, G. M., Utica.
Foster, P. M., Whitesboro.
Fowler, E. P., New York City.
Gould, L. A., Schenectady.
Guntzer, J. H., New York City.
Hanbidge, W. B., Ogdensburg.
Haskell, C. K., Bath.
Hawkes, Forbes, New York City.
Herman, Henry, New York City.
Johnson, F. M., Jr., Yonkers.
Kellogg, J. H., Bemus Point.
Kinch, C. A., New York City.
Livingston, E. P., New York City.
Loughran, E. H., Kingston.
Mace, H. M., Catskill.
Mandel, A. R., New York City.
McCauley, J. W., Rochester.
McLean, F., Chenango Forks.
Miles, G. W., Oneida.
Moschowitz, A. V., New York City.
Myers, H. G., New York City.
O'Connor, T. S. A., Troy.
Padelford, C. E., Clarendon
Parker, S. H., Sonyea.
Peiser, Louis, New York City.
Reynolds, G. H., Delhi.
Reynolds, H. H., Malone.
Richards, B. A., Rochester.
Rulison, E. T., Schenectady.
Schapira, S. W., New York City.
Schollderfer, Edmund, Yorktown Heights.
Sharp, J. C., Brooklyn.
Sherman, W. T., Crown Point Center.
Shoudy, J. C., Syracuse.
Spiegel, Leo, New York City.
Todd, J. C., Tarrytown.
Whaley, J. H., Rome.
Wheeler, L. H., Lockport.
Whitney, L. A., Rochester.
Williams, J. G., Brooklyn.
Woodruff, J. B., Rochester.

NORTH CAROLINA.

Fox, M. F., Guilford College.
Gilmore, W. D., Cameron.
Grahem, W. A., Durham.
Hall, J. K., Morganton.
Hassell, S., Plymouth.
Knight, J. B. H., Williamston.
Little, T. R., Greensboro.
Moncure, William, Raleigh.
Murphy, W. B., Snowhill.
Myers, J. Q., North Wilkesboro.
Sexton, C. H., Dunn.
Strickland, E. F., Bethania.
Walker H. D., Elizabeth City.
Ward, W. H., Plymouth.

NORTH DAKOTA.

Bentzen, Olaf, Grand Forks.
Forbes, C. G., Washburn.
Le Bien, E. A., McHenry.
Schanche, H. S., Portland.
Scott, W. W., Walhalla.

OHIO.

Bainter, R. B., Zanesville.
Balsley, A. W., Findlay.
Brubaker, J. L., West Hope.
Force, C. A., Attica.
Gorbold, A. A., Ross.
Hartman, S. D., Tippecanoe City.
Hattery, Seth, Massillon.
Heyde, J. M., Walnut Creek.
Horton, E. G., Columbus.
Howell, J. G., Freeport.
Kauffman, H. R., Staunton.
Kellum, M. R., North Royalton.
Kimerline, C. E., New Washington.
Lucas, W. W., New Washington.
MacFarland, C. H., Jr., Cleveland.
Martz, G. J., Hollansburg.
McMillen, J. B., Somerton.
Moore, F. P., Lisbon.
O'Neill, O. U., Ironton.
Palmer, D. G., Geneva.
Pierret, G. A., Madisonville.
Strohbach, George, Cincinnati.
Uberroth, Marion W., Tiffin.

OKLAHOMA.

Mills, J. T., Henderson.
Will, A. A., Oklahoma.

PENNSYLVANIA.

Arthur, W. C., Newville.
Benz, H. J., Pittsburg.
Castlebury, A. M., Williamsport.
Dyson, J. R., Hazleton.
Edie, E. B., New Haven.
Fiet, Harvey J., Philadelphia.
Frank, A. C., Pittsburg.
Green, G. D., Lock Haven.
Hammond, C. C., Wishaw.
Kennedy, A. R., Philadelphia.
Laughlin, Rebecca P., Waynesboro.
Long, Charles, Altoona.
Metzler, Gottfried, Philadelphia.
Plank, J. R., Steelton.
Reed, M. W., South Fork.
Shannon, C. E. G., Philadelphia.
Swigart, S. W., Lewistown.
Willock, J. S., Pittsburg.
Wyckoff, S. D., Wilkes-Barre.

RHODE ISLAND.

Scanlon, M. H., Westerly.

SOUTH CAROLINA.

Haines, H. T., Jonesville.
Reese, J. H., Tatum.

SOUTH DAKOTA.

Atkinson, J., Spencer.
Benner, W. J., Willow Lakes.
Brink, F. A., Pierre.
Hohf, J. A., Gayville.
Kaps, F. O., Winfred.
Sampson, I. J., Mellette.
Yates, C. A., Clark.

TENNESSEE.

Bowen, William, Knoxville.
Brown, T. B., Columbia.
Byrd, E. H., East Chattanooga.
Catlett, W. A., Sevierville.
Dahney, T. G., Memphis.
Farmer, W. S., Gentry.
Hardison, S. T., Lewisburg.
Hargis, Frank, Chestnut Mound.
Hibbett, W. E., Nashville.
Jones, Heber, Memphis.
Moore, W. P., Memphis.
Northcutt, E. E., McMinnville.
Simpson, W. L., Memphis.

TEXAS.

Abell, G. C., Texarkana.
Beck, J. W. H., Loraine.
Burnett, S. H., Kountze.
Byars, James, Columbus.
Clark, W. A., Cumby.
Cobb, G. M., Ely.
Decherd, G. M., Austin.
Dice, R. J., Byers.
Durham, C. E., Hico.
Elmendorf, E. H San Antonio.
Gibson, J. F., Paris.
Graves, A., Jr., San Antonio.
Helms, W. L., Maud.
Hogan, S. L., Pottsboro.
Holt, J. H., Sherman.
Howell, Asa, Burnett.
Kennemm, W. E. Sulphur Springs
LeMaster, R. R., Goliad.
Marrs, M. C., Caro.
McBride, W. C. Denton.
Meharg, J. O., Fort Worth.
Motherol, J. D., Cotulla.
Rainey, J. E., Clarksville.
Roberts, T. F., Paris.
Smith, H. R., Detroit.

Underwood, S. J., Morgan Mill.
Ware, Ella, Stockdale.

VERMONT.

Branch, G. H., Grand Isle.
Hutchinson, A. T., Burlington.
Lee, H. H., Wells River.

VIRGINIA.

Brown, S. E., Norfolk.
Carson, H. C., Sugar Grove.
Cherry, T. M., Glamorgan.
Harris, Percy, Tye River.
Iden, B. F., Manassas.
Kendig, E. L., Victoria.
Kendig, W. D., Tinkling.
Pine, J. S., Lebanon Church.
Ross, C. F., West Point.

WASHINGTON.

McDowell, W., Seattle.

WEST VIRGINIA.

Sole, J. R., New Martinsville.
Varner, S. W., Glenville.

WISCONSIN.

Cook, D. M., Gays Mills.
Donnelly, F. J., Monches.
Kingsley, J. R., Sheboygan.
O'Leary, T. J., East Troy.
Pearce, W. J., Dodgeville.
Smith, O. E., Mukwonago.
Stein, J. F., Pulcifer.

WYOMING.

Nelson, N. D., Shoshomi.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Queries for this column must be accompanied by the writer's name and address, but the request of the writer not to publish name or address will be faithfully observed.

SYPHILITIC INFECTION FROM DEAD BODIES.

SAN FRANCISCO, Jan. 11, 1907.

To the Editor:—In an editorial in THE JOURNAL, Oct. 27, 1906, this statement is made: "It is well known that inoculation of syphilis from dead bodies, either in course of autopsy or later in the dissecting room, have never been reported. As some of the autopsies on syphilitic subjects have been undertaken within a few hours after death, and occasional accidental injuries have been produced during such autopsies, yet without positive results, it would seem clear that the microbe of syphilis dies almost simultaneously with its host."

In refutation, I am submitting a few cases which certainly are authentic, considering their sponsors:

R. W. Taylor ("Some Unusual Modes of Infection with Syphilis," *Journal of Cutaneous and Genito-Urinary Diseases*, June, 1890, p. 201), in reporting two cases that came to his notice, says: "With the exception of the eminent Danish syphilographer, Dr. R. Bergh ("Ueber Anstechung und Anstechungswege bei Syphilis," (*Monatshr. f. prak. Dermatologie*, vol. vii, 1888, p. 149), I believe no author has treated of the occurrence of syphilitic infection from the cadaver of a person who died during the active stage of the disease." Taylor's first case was a young physician who infected himself while making a postmortem examination, held eight hours after death, on the body of a patient who died from malignant syphilis. His second case was a physician twenty-six years of age, who infected himself while making an autopsy nine hours after death on the body of a prostitute. The chancres in both cases were located on the fingers.

Morrow (*Jour. of Cutaneous and Genito-Urinary Dis.*, 1898, p. 541) reports the case of a physician who received his chancre on the terminal phalanx of the left index finger. The patient stated that the lesion had developed at the site of injury which he had inflicted on himself with a knife while performing an autopsy.

Blaschko (*Berlin. klin. Wochschr.*, xli No. 52) states that in his observation of twelve cases of syphilis in physicians, there was one case where infection was unmistakably derived from dissection of a syphilitic cadaver twenty-four hours after death.

E. H. Hansteen also mentions a case of infection from a cadaver (*Norsk Magazin. f. Laegevidenskaben*, Christiania, lxvii, No. 6).

As the text-books are silent on this particular mode of extragenital infection, I trust this short communication will lead physicians to be more cautious in handling these dangerous subjects.

LOUIS GROSS, M.D.

ANSWER.—We are glad to have these instances of apparent infection from cadavers called to our attention. The very fact that so few cases have been reported, although probably thousands of autopsies on syphilitic subjects are made every year, tends to throw some doubt even on the reality of these. If the danger of such infection were always present we should expect to find many more cases reported. It must not be forgotten that practically every patient who dies in the large hospitals in Europe comes to the autopsy table. It has been repeatedly stated that 20 per cent. of the population of the large towns are infected with syphilis and that at least one in three of those who are treated in hospitals are, or have been, sufferers from the disease. In spite of this no special precautions are ever taken to avoid the possible communication of the disease in the pathologic department. There is a tradition in the autopsy rooms of such large hospitals as the Charité in Berlin and the Allgemeines Krankenhaus in Vienna, that such infections do not take place, and as a consequence the bodies of patients who are known to have been sufferers from syphilis are not designated in any way in order to call special attention to the fact so that more care should be taken. Most of the cases of reported cadaveric infection in the literature occurred in physicians who were in active practice and happened casually to make an autopsy during which they infected themselves. In these cases, the possibility of their having become infected from other sources in the course of their practice can not be entirely excluded. If, moreover, the infrequency of the reported cases is taken into consideration, it would seem as though the general persuasion as to the non-infectiousness of cadaveric liquids or tissues from syphilitic subjects is probably true. On the other hand, in the editorial in which the statement was made with regard to the absolute non-occurrence of such cases, attention was called to the fact that the lesions of late syphilis, formerly considered to be absolutely incapable of conveying the disease, are, by a series of cases that can not be doubted, now proved to be contagious. Our ideas with regard to syphilis are being much modified in recent years, though the amount of study devoted to the disease might seem to have exhausted knowledge with regard to so important a subject. It is possible then, that the other persuasion with regard to absence of infection from the cadaver may be a mistake, and precautions should, therefore, be taken. Any one who has had much experience with syphilis knows how often primary lesions are taken for something else, especially when they are mild in character, and knows also how fleeting may be the manifestation of secondary symptoms. It is possible that many more such syphilitic infections take place than is known. The subject is well worth investigating and because it represents an important problem in prophylaxis, it deserves the careful attention of the young generation of American physicians.

A PHYSICIAN'S EXPERIENCE WITH THE AUTOMOBILE.

SHELBYVILLE, IND., Jan. 23, 1907.

To the Editor:—Having been one of the pioneers among the medical profession of my state in the use of an automobile I thought it might not be uninteresting to other members of the profession to give you something of the cost and maintenance of a machine. I purchased my first machine in February, 1902, for delivery April 1. During the five years that I have had a machine I have used it 8 months each year, that is from April to November, inclusive. I used it one year until late in December, but it was unsatisfactory for the reason that it was impossible to wrap up sufficiently to keep warm, and if trouble should occur on the road it was not pleasant to sit on the fence and wait for the repair man. Besides this, with a water-cooled machine there is the constant danger of freezing up, with consequent bursting of pipes, cylinders, etc.

I have kept an accurate account of the expense connected with my machines, as the following will show. This account includes three new machines, which must be counted in the cost, as after two years any machine is practically worthless. In my business I wear out a machine in two years and about 6 tires each year. My expenses have been as follows: This includes new machines, tires, gasoline, repairs, storage, etc.

1902	$ 990.57
1903	1,160.05
1904	583.04
1905	1,189.28
1906	556.82
Total	$4,479 76

The first year the machine was out of commission at least one-third of the time on account of repairs. In 1905 I was in New York for six weeks and of course the machine was not in use during that time. It is impossible for a physician to be without a horse in case of emergency, and this expense must be incurred also. Using a machine eight months in the year this amount will make the cost $895.95 per year and $111.99 per month. This is a conservative statement, as there must have been many days in the five years that it was not in use either on account of repairs or other purposes. Another item of expense not to be ignored is the increased cost of gasoline. It has more than doubled in the past five years, and will no doubt continue to advance because of the constantly increasing demand for it. In concluding I will say that I have no advice to offer to any one on the subject of automobiles, except: Don't believe an automobile salesman when he tells you that it is cheaper to maintain than a horse.

SAMUEL KENNEDY, PH.G., M.D.

INJECTION TREATMENT OF "GOITER."

MULBERRY GROVE, ILL., Jan. 24, 1907.

To the Editor:—A claim was recently made by a physician that he was able to cure goiter by hypodermic medication, administered once or twice a week. As I know of no remedy that will effect a cure in this manner, and, after consulting a number of authorities, can find no reference of the method, I write for any information that can be given. E. A. GLASGOW, M.D.

ANSWER.—If by "goiter" is meant the ordinary enlargements of the thyroid gland, its treatment by injection with the hypodermic needle is very old. Tincture of iodin was perhaps one of the first remedies used in this way. About 20 years ago, 5 per cent. carbolic acid was a very popular injection. These injections soon pass into desuetude. More recently Dubar has treated these cases by injecting 1 c.c. of 40 per cent. iodoform-oil into the gland once a week. Beck has brought into use the Roentgen-ray as a means of differentiating those cases in which the injection method is useful. By this means he is able to exclude those in which lime salts are deposited and which he considers unsuited to the injection treatment. The others, or so-called "negative cases," he treats by injecting

iodoform-ether. The operative treatment of the ordinary goiter, however, as practiced to-day, is so much more satisfactory that the injection method, with its uncertainties and risks, finds few followers. If the question refers to goiter of the exophthalmic variety, or Basedow's disease, it is entirely another matter, as a number of so-called sera have been produced recently for this condition, some of which may be used internally and some hypodermically. The antithyroidin of Moebius in Germany, and the sera of Murray in England, and of Rogers and Beebe in this country are prepared in different ways, according to the particular experimenter's views. The results obtained from their use have been variable, some reporting apparent success, others complete failure, so that, in the present state of our knowledge, nothing definite can be said concerning their value.

A DEATH-BED ADVERTISEMENT.

Under the above heading the *British Medical Journal* prints the following unkind comment about a surgeon whose name is, by some means, very frequently before the public:

> In a recent issue of the *St. James' Gazette* the following paragraph appeared: "Lady ——, who last year was very ill, is now much better. She was for some time under the care of Dr. Doyen of Paris, and speaks most highly of his treatment." A day or two later the name of Lady —— appeared in the obituary column of the *Times*. The poor lady might have said, with Alexander Pope, that she was dying of favorable symptoms. But even a dying patient has his uses for the cancer curer, for he continues to "get better" to the very last.

ABSCESS OF LIVER.

FAYETTEVILLE, N. C., JAN. 24, 1907.

To the Editor:—Will you kindly give me some information or send me some literature whereby I can get authentic data on abscess of the liver in this country? J. H. MARSH, M.D.

ANSWER.—It is assumed that "in this country" means within the boundaries of the United States. The increased traffic between the United States and her island ports already has been the means of increasing the number of liver abscesses "in this country," as shown by the report of Craig (*Annals of Surgery*, xxxix, 711) at the Army General Hospital, Presidio of San Francisco, who finds that in 5 per cent. of the dysenteric cases the patients have liver abscess complications. He says that owing to the "large numbers of dysenteric patients returning yearly to our shores, the subject will be of some interest to physicians under whose care these cases eventually come for treatment." This percentage of liver abscess is very much higher than occurs in cases of dysentery indigenous to this country. Suppuration in the liver is due to the same specific cause as suppuration elsewhere in the body, viz., the presence of pyogenic microbes. These microbes reach the liver through the portal circulation; through the systemic circulation; by direct extension through the tissues; by direct implantation (trauma). By far the most common infection atrium is the ulceration which takes place in the lower bowel in the dysentery of the tropics. The microbes entering the distal radicles of the portal circulation reach the liver where they lodge and give rise to what is commonly called tropical abscess of the liver. Excluding the tropical abscess, which is rare in this country except when imported, the most common antecedents of abscess of the liver are well shown in the following table of 108 cases collected by Barensprung (*Langenbeck's Archives*, xviii, 557.)

Pyemia (Septic emboli from local infected areas)		30
Pyemia (complicating local infected areas without demonstrable emboli)		13
Injuries of the liver		13
Ulceration processes in the region of the portal vein:		
Cecum and appendix	8	
Cancer of the stomach	5	
Cancer of uterus and vagina	3	
Cancer of pancreas	1	
Femoral hernia	1	18
Infections of the gall tracts		11
Gangrene and abscess of lung		4
Diabetes mellitus		1
Phosphorus poisoning		1
Unknown		5
		108

All four of the routes mentioned above by which microbes may reach the liver are illustrated in the table. Although not mentioned in the above table, abscess of the liver occasionally follows typhoid fever, as shown by Da Costa (*Amer. Jour. of Med. Sci.*, July 1898) and by Sheldon (*Amer. Jour. of Med. Sci.*, cxxv, 618). As the pyemic abscesses are usually discovered at postmortem and are associated with multiple abscesses in other organs of the body, they seldom become the subject of surgical intervention. Excluding these, therefore, it is found that more than 50 per cent. of the abscesses of the liver are due to localized infections of some of the intra-abdominal organs tributary to the portal vein, and as the large majority of them occur late in the course of these diseases, rather as terminal complication, most of them could be prevented by timely recognition and treatment of the primary condition. The diagnosis of abscess of the liver is not always easy, in fact at times it may be impossible. One of the most important points in connection with the diagnosis is the recognition of the fact that the above mentioned conditions may be complicated with abscess of the liver. Whenever one of these affections begins to deviate from its usual clinical history and the patient, instead of progressing to recovery, continues to manifest an irregular fever: to complain of a sense of fulness, or of discomfort or of pain in the region of the liver; to assume constantly a right-sided decubitus; to exhibit tenderness on pressure over the liver; perhaps to show an enlargement of the liver on examination, etc., an abscess of the liver must be suspected and its presence demonstrated or disproved by direct means if necessary. For details as to diagnosis, consult Rhoads' excellent article (*Annals of Surgery*, xxxix, 711). As the prognosis of liver abscess uninterfered with is decidedly bad, all cases should be treated surgically at the earliest possible moment, and not simply by aspiration but radically by thorough opening and drainage. As to the superiority of radical measures over aspiration, etc., see Johnson's article in *Annals of Surgery*, xxvi, p. 424.

The Public Service

Army Changes.

Memorandum of changes of stations and duties of medical officers, U. S. Army, week ending Feb. 2, 1907.

Murtagh, John A., asst.-surgeon, leave of absence extended one month.

Mason, Charles F., surgeon, appointed member of board of officers to meet at Fort Monroe, Va., to consider the requirements of the situation of that post with reference to the Jamestown Exposition.

Smith, Herbert M., asst.-surgeon, granted two months' leave of absence, to take effect about March 1, 1907.

Krebs, Lloyd LeR., asst.-surgeon, relieved from duty at General Hospital, Fort Bayard, N. M., and ordered to Fort Hancock, N. J., for duty.

Harvey, Philip F., asst.-surgeon-general, relieved from duty as chief surgeon, Department of the East, and on expiration of present leave of absence will proceed to Chicago, for duty as chief surgeon, Department of the Lakes.

Davis, William B., deputy surgeon-general, relieved from duty as chief surgeon, Department of the Lakes, Chicago, and will proceed to Governor's Island, N. Y., for duty as chief surgeon, Department of the East.

Whitney, Walter, contract surgeon, granted an extension of one month to his leave of absence.

Gregory, Verdo B., contract surgeon, arrived at Fort Adams, R. I., for duty.

Ames, Roger P., contract surgeon, granted leave of absence for one month.

Chase, Alpha M., contract surgeon, granted leave of absence for one month.

Leeper, John F., contract surgeon, ordered from Fort Duchesne, Utah, to the Army General Hospital, Fort Bayard, N. M., for treatment.

Brooks, John D., contract surgeon, returned to Fort Meade, S. D., from leave of absence.

Tyler, George T., contract surgeon, order for duty at Fort Wadsworth, N. Y., revoked; will remain at Fort Monroe, Va.

Allen, Ira A., contract surgeon, granted leave of absence for one month.

Navy Changes.

Changes in the Medical Corps, U. S. N., for the week ending Feb. 2, 1907.

Leys, J. F., surgeon, detached Norfolk Hospital, duty with Department of Government and Sanitation, Canal Zone, sailing from New York, February 5, 1907.

Marsteller, E. H., surgeon, detached Naval Recruiting Station, Baltimore, ordered to U. S. S. *Franklin*.

Decker, C. H., surgeon, orders to U. S. S. *Franklin* revoked.

Bachman, R. A., P. A. surgeon, detached Naval Recruiting Station, Minneapolis, ordered to U. S. S. *Franklin*.

Michels, R. H., asst.-surgeon, order of January 22, modifying order of January 4, revoked.

Miller, J. T., acting asst.-surgeon, detached U. S. S. *Franklin*, ordered to Naval Recruiting Station, Minneapolis.

Gill, J. E., P. A. surgeon, orders of January 22, 1907, revoked.

Bogan, F. M., P. A. surgeon, ordered to Naval Recruiting Station, Baltimore, Md.

Straeten, R. J., asst.-surgeon, duty Naval Hospital, Mare Island, Cal.

Grieve, C. C., asst.-surgeon, detached U. S. S. *Southery*, to duty Navy Yard, Portsmouth, N. H.

Traynor, J. P., P. A. surgeon, detached Navy Yard, Boston, ordered *Scorpion*.

Chapman, R. B., asst.-surgeon, detached Navy Yard, Mare Island, Cal., ordered Naval Recruiting Station, Oklahoma, Okla.

Murphy, J. F., P. A. surgeon, detached U. S. S. *Georgia*, ordered to U. S. S. *Scorpion*.

Traynor, J. P., P. A. surgeon, orders of Jan. 30 modified, when detached from Navy Yard, Boston, ordered to U. S. S. *Georgia*.

Public Health and Marine-Hospital Service.

List of changes of station and duties of commissioned and non-commissioned officers of the Public Health and Marine-Hospital Service for the seven days ended Jan. 30, 1907:

Gwyn, M. K., P. A. surgeon, granted an extension of leave of absence for two days from January 18.

Stimson, A. M., asst.-surgeon, leave of absence granted for seven days from January 16 amended to read five days.

Mullan, E. H., asst.-surgeon, granted leave of absence for fourteen days from February 7.

Falk, Charles C., acting asst.-surgeon, granted leave of absence for ten days, from January 15, 1907.

Knowles, Ralph, acting asst.-surgeon, granted leave of absence for five days from Jan. 28, 1907, under Paragraph 210 of the Regulations.

Watts, T. W., acting asst.-surgeon, granted leave of absence for nine days from Jan. 22, 1907.

Brown, F. L., pharmacist, granted leave of absence for ten days from Jan. 29, 1907.

Richardson, S. W., pharmacist, granted leave of absence for ten days from Feb. 7, 1907.

BOARD CONVENED.

A board of medical officers was convened to meet at Baltimore, Jan. 28, for the physical examination of applicant for cadetship in the Revenue Cutter Service. Detail for the Board: Surgeon L. L. Williams, Chairman; P. A. Surgeon D. E. Robinson, Recorder.

Health Reports.

The following cases of smallpox, yellow fever, cholera and plague have been reported to the Surgeon-General, Public Health and Marine-Hospital Service during the week ended Feb. 1, 1907.

SMALLPOX—UNITED STATES.

California: Quincy, Dec. 1-15, 10 cases; Marion County, Jan. 19-26, 6 cases, Polk County, 10 cases.
Georgia: Augusta, Jan. 15-22, 11 cases.
Illinois: Chicago, Jan. 19-26, 1 case; Galesburg, 11 cases; Peoria, 6 cases.
Indiana: Indianapolis, Jan. 13-20, 12 cases; South Bend, Jan. 19-26, 10 cases; Terre Haute, 1 case.
Louisiana: New Orleans, Jan. 19-26, 2 cases (imported).
Missouri: St. Joseph, Jan. 12-19, 4 cases.
New York: New York, Jan. 19-26, 2 cases.
Ohio: Cincinnati, Jan. 18-25, 1 case.
Virginia: Hanover County, Jan. 31, 35 cases.

SMALLPOX—FOREIGN.

Argentina: Buenos Ayres, Dec. 1-22, 5 cases, 1 death.
Brazil: Pernambuco, Dec. 1-15, 35 deaths; Rio de Janeiro, Dec. 23-30, 1 case.
Nova Scotia: Colchester County, Jan. 19, present; Cumberland County, present; Pictou County, present.
China: Shanghai, Dec. 19-26, 1 death.
France: Marseilles, Dec. 1-31, 88 deaths; Paris, Dec. 29-Jan. 5, 8 cases.
Italy: General, Jan. 3-10, 1 case.
Malta: Dec. 15-22, 1 case.
Mexico: State of Tamaulipas (on line of Mexican Central R. R.), Jan. 18, epidemic.
Russia: Moscow, Dec. 15-29, 3 cases, 1 death.
Spain: Barcelona, Jan. 1-10, 7 deaths; Cadiz, Dec. 1-31, 8 deaths.

YELLOW FEVER.

Brazil: Rio de Janeiro, Dec. 23-30, 1 case, 1 death.

CHOLERA.

India: Bombay, Dec. 25-Jan. 1, 8 deaths; Madras Presidency, Nov. 1-30, 10,700 cases, 6,305 deaths, Dec. 1-15, 5,256 cases, 3,293 deaths; Rangoon, Dec. 15-22 cases, 39 deaths.

PLAGUE.

Arabia: Djeddah, Jan. 9, 1 case.
Brazil: Bahia, Dec. 8-29, 13 cases, 5 deaths; Rio de Janeiro, Dec. 22-30, 12 cases, 8 deaths.
Egypt: Alexandria, Jan. 4, 1 death; Ishmailia, Jan. 6, 1 case; Keneh, Jan. 9, 1 case, 1 death.
Gibraltar: Dec. 16-Jan. 13, 7 cases.
India: Bombay, Dec. 25-Jan. 1, 13 deaths; Rangoon, Dec. 15-22, 15 deaths.
Japan: Formosa, Nov. 1-30, 100 cases, 84 deaths.
Peru: Catacaos, Dec. 1, 10 cases, 7 deaths; Mollendo, 7 cases; Pacasmayo, 4 cases, 2 deaths; Paita, 2 cases, 1 death; Trujillo, 48 cases; 2 deaths.

Marriages

FRANCIS A. SCHULTE, M.D., to Miss Marie Powers, both of St. Louis, January 14.

WILLIAM A. STOECKS, M.D., to Miss Anna Koch, both of Davenport, Iowa, January 26.

MATILDA MAY BEERS, M.D., and A. S. Lindenfeld, both of St. Joseph, Mich., January 26.

ROY V. HAUVER, M.D., to Miss Margaret Ellen Remsburg, at Middletown, Md., January 16.

MCCRÉA C. BANKS, M.D., to Miss Amelia Smith, both of Raleigh, W. Va., January 12.

GRANVILLE TURNER COLLINS, M.D., Highland Springs, Va., to Miss Elsie McDowell, January 15.

HAROLD J. LEVIS, M.D., to Miss Margarethe Schroedel, both of Rochester, N. Y., January 31.

JOSEPH T. IRBY, M.D., Enterprise, Miss., to Miss Epphie Smith, at Oakland, Tenn., recently.

ARTHUR E. SHAW, M.D., to Miss Elizabeth Logan Graham, both of Columbia, S. C., January 23.

VERNON ALASKA CHAPMAN, M.D., to Miss Marjory Smith, both of Muskegon, Mich., January 28.

EDWARD F. YOUNGER, M.D., Brooknéal, Va., to Miss Grace E. Gilliam, at Lynchburg, Va., January 23.

VICTOR MAZURIE REYNOLDS, M.D., Darby, Pa., to Miss Lulu Ann Dobelbower, Prospect Park, January 25.

HENRY LYNDE WOODWARD, M.D., Cincinnati, Ohio, to Miss Estelle Nixon, at Ironton, Ohio, January 16.

WILLIAM VINCENT LAWS, M.D., Hot Springs, Ark., to Miss Mary Josephine Pottinger, Chicago, January 29.

FREDERICK STEVENS SMITH, M.D., to Miss Helen Louise Josselyn, both of North Andover, Mass., January 22.

Deaths

Arnot Spence, M.D. Bellevue Hospital Medical College, N. Y., 1884; a member of the New York County Medical Society; American Academy of Medicine and the Association of Military Surgeons of the United States; major and surgeon in the Ninth regiment, National Guard; visiting physician to St. Joseph's Home for Consumptives, died at his home in New York City, January 26, aged 43.

Charles Wilmot Townsend, M. D. College of Physicians and Surgeons in the city of New York, 1890; one of the best known physicians on Staten Island, was shot and fatally wounded while in bed, at his home at New Brighton, early in the morning of January 26 by the husband of a former patient, it is said, and died late the same night, aged about 40.

William C. Lott, M.D. University of Pennsylvania, Philadelphia, 1885; a veteran of the Spanish-American War; a fellow of the American Academy of Science, of the Philadelphia Academy of Surgery and a member of the Philadelphia County Medical Society, died at his home in Philadelphia, January 21, aged 49.

Richard H. McDonnell, M.D. Barnes Medical College, St. Louis, 1893; formerly physician in charge of the Emergency Hospital, Colorado City, and for a number of years a practicing physician at Colorado Springs, died at his home in Pittsburg, Kans., January 9.

M. W. Waterman, M.D. Bellevue Hospital Medical College, 1871; for many years a practicing physician in New York state and northern Wisconsin; at one time coroner's physician in New York City, died at the home of his son in Chicago, January 25, aged 55.

William D. Milroy, M.D. College of Physicians and Surgeons, Chicago, 1900; secretary of the city board of health, Logansport, secretary of the Citizen's Club, Logansport; died at his home in that city, January 20, after an illness of three months, aged 37.

Joseph Manning Cleveland, M.D. College of Physicians and Surgeons, New York, 1850; superintendent of the Hudson River State Hospital, Poughkeepsie, from 1867 to 1893, died at his home in that city, January 21, from pneumonia, aged 82.

Harry Sheldon Allen, M.D. Rush Medical College, Chicago, 1902; a member of the American Medical Association; died at the home of his father in Keithsburg, Ill., January 18, after an illness of several months, aged 29.

Matthew T. Fulcher, M.D. Medical Department of Washington University, St. Louis, 1878; who retired from the practice of medicine a year ago to enter the ministry, died suddenly at his home in Belle, Mo., January 20, aged 63.

David B. Ward, M.D. College of Physicians and Surgeons, New York, 1876; city bacteriologist, Poughkeepsie, N. Y., died at his home in that city, January 24, after an illness of a few days, aged 53.

Henry A. LeBarbier, M.D. Dartmouth Medical School, Hanover, N. H., 1891; fleet surgeon of the Larchmont Yacht Club, died at his home in Larchmont, N. Y., of facial erysipelas, January 21, aged 50.

George Douglass, M.D. Medical College of the state of South Carolina, Charleston, 1877; of Union, S. C., died at Johns Hopkins Hospital, Baltimore, after a short illness, aged about 56.

Ernest Jonsson Oarby, M.D. Dearborn Medical College, Chicago, 1906; died in Passavant Hospital, Chicago, January 24, as a result of street car injuries, sustained January 22, aged 32.

S. W. Dennis, M.D. University of Pennsylvania, Philadelphia, 1875; a prominent physician of San Francisco, died at St. John's Hospital, Oakland, January 21, from pneumonia.

Robert W. Gray, M.D. Medical School of Maine, Portland, 1861; a veteran of the Civil War, died at his home in Boston, January 20, after an illness of several weeks, aged 71.

Halsey B. Jenks, M.D. University of Michigan, Ann Arbor, 1870; a veteran of the Civil War, died at his home in Ypsilanti, Mich., January 19, after a long illness, aged 64.

Absalom A. Adair, M.D. Rush Medical College, Chicago, 1857; a former practitioner of Kellogg, Iowa, died at his home in Des Moines, January 23, from apoplexy, aged 78.

Archibald Crary, M.D. Starling Medical College, Columbus, Ohio, 1883; died suddenly at his home in Huntington, W. Va., January 10, from a nervous affection, aged 60.

George B. Ridley, M.D. College of Physicians and Surgeons, Chicago, 1904; pathologist of Ancon Hospital, Canal Zone, died at that place from pneumonia, aged 33.

John H. White, M.D. University of Nashville, 1872; a member of the State Medical Association; died at his home at Bell Buckle, Tenn., January 21, aged 57.

Christopher P. Lyons, M.D. Harvard University, Boston, 1892; died at his home in Boston, January 27, after an illness of a few days, aged 36.

Edith A. Emmett, M.D. Homeopathic Medical College, Kansas City, Mo., 1883; died at her home in Kansas City, after a year's illness, January 19.

Robert B. Thomson, M.D. Sioux City College of Medicine, 1906; died at his home in Ida Grove, Iowa, from typhoid pneumonia, January 21, aged 24.

Julius Roane, M.D. Medical College of Virginia, 1853; a veteran of the Civil War; died at his home in Charles City, Va., January 18, aged 80.

Oliver K. Reynolds, M.D. Missouri Medical College, St. Louis, 1859; formerly of Fieldon, Ill., died recently in Oklahoma City.

Ulysses S. Grant Fink, M.D. Jefferson Medical College, died at his home in Larchmont, N. Y., from facial erysipelas, January 13.

George Thayer, M.D. Geneva Medical College, Geneva, N. Y., 1848; died at his home in Medina, N. Y., from paralysis, January 19.

James H. Kime, M.D. University of Oregon, Portland, 1890; died at his home in Fortuna, Cal., January 12, from pneumonia, aged 70.

Joseph H. Peebles, M.D. University of Nashville, 1891; a prominent physician of Shelbyville, died January 18, aged 42.

Deaths Abroad.

L. **Emile Javal, M.D.**, the well-known ophthalmologist of Paris, inventor of the Javal ophthalmometer, died recently, aged 68. His published works dealt mainly with the physiology of optics and hygiene of schools until 1900, when he became blind from glaucoma. After this date he published a work, Entre Aveugles—(From the Blind to the Blind), which has been translated into several languages, and also a work on the physiology of reading, writing, etc., and several communications on reading for the blind and allied subjects.

P. J. **Moebius, M.D.** Privat docent of neurology at Leipsic until 1893, died recently, aged 53. His works on neurology, on the pathology of Goethe, Rousseau, Schopenhauer and Nietzsche, on migraine and various aspects of psychology are well known, but his fame chiefly rests on his research on exophthalmic goiter and his treatment of it, with the serum of thyroideetomized sheep. The latest edition of his work, "Exophthalmic Goiter," 1906, states that no treatment gives positive, certain results except surgical intervention. The operation is more dangerous than under other conditions, he says, but its curative action is beyond question. Moebius preached the physiologic inferiority of the female mind and made many enemies by his critical summaries in Schmidt's *Jahrbücher* of which he has been editor since 1885. He never married. He has been lately engaged in drawing up the plans and specifications for the Rothschild million dollar endowment at Vienna for curable nervous affections. In his report he insisted that the physicians connected with the institution should receive sufficient salary to permit them to marry and to make the work of the institution their life work.

Medical Education and State Boards of Registration

COMING EXAMINATIONS.

KANSAS **State Board** of Medical Registration and Examination. Topeka, February 12. Secretary, Dr. F. P. Hatfield, Grenola.

NEBRASKA **State Board** of Health, State House, Lincoln, February 13-14. Secretary, Dr. George H. Brash, Beatrice.

MAINE **Board of Registration** in Medicine, Common Council Room, Portland, March 5 Secretary, Dr. W. J. Maybury, Saco.

MASSACHUSETTS **Board** of Registration in Medicine, Room 15, State House, Boston. March 12-13. Secretary, Dr. Edwin B. Harvey, Room 159, State House, Boston.

CONNECTICUT **Medical** Examining Board (Regular), City Hall, New Haven, March 12-13. Secretary, Dr. Charles A. Tuttle, New Haven.

CONNECTICUT **Eclectic** Medical Examining Committee, State Capitol Building, Hartford, March 12. Secretary, Dr. George A. Faber, Waterbury.

CONNECTICUT **Homeopathic** Medical Examining Committee, New Haven, March 12. Secretary, Dr. Edwin C. M. Hall, New Haven.

IOWA **Board of Medical** Examiners, Des Moines, March 19-21. Secretary, Dr. Louis A. Thomas, Des Moines.

OKLAHOMA **Board** of Medical Examiners, Guthrie, March 26-27. Secretary, Dr. J. W. Baker, Enid.

North Dakota January Report.—Dr. H. M. Wheeler, secretary of the North Dakota State Board of Medical Examiners, reports the written examination held at Grand Forks, Jan. 2-5, 1907. The number of subjects examined in was 14; percentage required to pass, 75. The total number of candidates examined was 15, of whom 13 passed and 2 failed. Four reciprocal licenses were granted at this examination. The following colleges were represented:

PASSED. College.	Year Grad.	Per Cent.
Illinois Med. Coll.	(1904)	76
College of P. & S., Chicago	(1905)	82
Chicago Homeo. Med. Coll.	(1895)	77
Minneapolis Coll. of P. & S.	(1902) 79; (1905)	85
University of Minnesota	(1904) 88; (1905) 82;	(1906) 85
Ohio Med. University	(1897)	78
Wisconsin Coll. of P. & S.	(1902)	79
Manitoba Med. Coll.	(1906)	89
University of Toronto, Ontario	(1906)	81
Trinity Med. Coll., Ontario	(1906)	77

FAILED.		
Gate City Med. Coll.	(1906)	*
University of Christiania, Norway	(1904)	*

REGISTERED THROUGH RECIPROCITY College.	Year Grad.	Reciprocity with.
American Coll. of Med. & Surg.	(1906)	Illinois
Keokuk Med. College, Coll. of P. & S.	(1906)	Iowa
University of Michigan	(1905)	Michigan
St. Louis University (Marion-Sims-Beaumont Med. Coll.)	(1906)	Illinois

* Percentage not computed.

Higher Preliminary Standards at the University of Pennsylvania.—Dr. Charles H. Frazier, dean of the Medical Department of the University of Pennsylvania, announces that the requirements for the session of 1908-9 as published in the annual announcement, have been modified to include (1) two foreign languages, one of which must be either French or German; (2) physics, based on at least one standard text-book and including laboratory work covering at least 35 exercises; (3) chemistry, with laboratory work in qualitative analysis which shall include two analyses of each group of metals and of acids, as well as analyses of at least six mixtures containing metals and acids of the various groups, and (4) general biology, or general zoology, based on a year's course of five hours per week or its equivalent, not less than two-thirds of the time being devoted to laboratory work, this to be supplemented by a study of some modern elementary text-book. For the last three subjects all students must submit laboratory note-books accompanied by the usual teacher's certificate as to the trustworthiness of the record. For the session of 1909-10 all students must have the equivalent of the freshman work in a recognized university including the work above outlined, and for the session of 1910-11 and thereafter the equivalent of the freshman and sophomore work in a recognized university, including the work in physics, chemistry, biology and languages.

Medical College Advertisements in the Lay Press.—Dr. A. P. Butt, secretary of the Barbour-Randolph-Tucker County (W. Va.) Medical Society reports that at the meeting of the society held Jan. 4, 1907, a resolution was passed concerning certain medical colleges:

WHEREAS, The profession of medicine is already very much overcrowded, there being a far greater number of physicians than there is demand for their services; and

WHEREAS, We believe there should be a desire on the part of men intending to study medicine which it is unnecessary to stimulate by the arts of advertising; and

WHEREAS, We believe that the men who, by means of advertising, might be led to make the study of medicine their life work, are not likely to be a credit to our profession or the public; and

WHEREAS, It has come to our knowledge that the —— of ——, and the —— of ——, are advertising in other than medical publications, therefore, be it

Resolved, That we, the members of the Barbour-Randolph-Tucker Medical Society believe it to be to the best interest of the profession and the public to discourage further attendance on these colleges, and on any and all other medical colleges that may advertise in other than medical journals.

Meeting of Texas Examiners.—Dr. T. T. Jackson, secretary of the Board of Medical Examiners for the State of Texas, reports that the next regular meeting of that board will be held in Austin, April 30 to May 2, 1907.

Section Discussions

RHEUMATISM IN CHILDREN.

(*Continued from page 501.*)

DISCUSSION

ON PAPERS OF DRS. SNYDER AND DUNN.

DR. S. M. HAMILL, Philadelphia, thought there was a liability to overlook the joint conditions of brief duration because they are so frequently unseen at the time they are present, because they do not impress those who care for the patients and because they are often not indicated by the child's symptoms. Another point is the prolonged and peculiarly mild temperature which he has observed very frequently. He is entirely in accord with Dr. Dunn relative to the difference between the clinical manifestations of the cases designated as rheumatic fever. He believes Dr. Dunn is right in attributing the so-called failure of cardiac compensation in these cases to the effect of the toxic process on the heart muscles rather than to the effect of exercise. Physicians are often misled in attributing it to the result of exertion, because such good results are obtained by placing the patients at absolute rest. The fact that 17 patients were discharged without cardiac lesion suggests the importance of differentiating between the functional and organic cardiac conditions. It has been his misfortune to have seen a number of cases of rheumatic fever which had been kept at rest for weeks because of functional murmurs, which were thought to have been organic. Functional murmurs and those arising from valvular lesions will not be confounded if studied carefully as to the position of the apex beat, the size of the heart, the point of location, the direction of transmission and the time of the murmur.

DR. ISAAC A. ABT, Chicago, said that Cheadle's dictum that cardiac lesions are manifestations and not complications of rheumatism must be regarded as a fact. Heart disease among children seems to be in some instances a family affair. He was not prepared to offer a general explanation of this fact, nevertheless his assistants and himself had noted among their dispensary material that in certain families a large proportion of the children were not only rheumatic, but also suffered from the associated heart disease. Whether this can be ascribed to environment alone, or whether possibly it is due to a rheumatic tendency in certain families, is not easy of explanation. He was glad to hear Dr. Dunn speak of the continuous fever which is noted in some of these cases of chronic endocarditis. A great number of times he has noted that children in the wards with chronic valvular disease and more or less ruptured compensation, would have some fever for weeks at a time. Perhaps Dr. Dunn's explanation is correct, that the fever is due to the persistent rheumatic infection which involves the cardiac valves or possibly other structures. Dr. Abt was inclined to question the correctness of Dr. Dunn's statement, namely, that in 77 of his cases there was no evidence of acute rheumatic infection at the onset of the disease. He should rather think that there was some error in obtaining the histories from the patients. Very frequently the patient neglects to give essential facts. He was inclined to adhere to the assumption of British physicians, who maintain that the large majority of cases of endocarditis among children is rheumatic in origin. English writers, too, emphasize the fact that rheumatism in children is an insidious affair, and may escape recognition. The very slight joint pains, torticollis, or pain located in the region of the cervical vertebra, the so-called growing pains, are in most instances rheumatic in character and should be treated accordingly. He believes it is of great importance that these cases of rheumatism in young life should be recognized early and treated energetically. The treatment with salicylates should be begun early, and the doses should be sufficiently large. If the rheumatic toxins, whatever their nature, can be neutralized at the inception of the disease, the damage to the heart will be greatly minimized. When the stomach does not tolerate the various preparations of salicylic acid, he is in the habit of giving suppositories containing gr. 10 of the salicylate of soda, and repeating them two or three times a day.

DR. R. T. GLENDENNING, Manchester, Mass., said that in January, 1905, he had an experience with a child. She had been playing about in the yard and came in, complaining of feeling tired. There was weakness of the ankles, high temperature, no redness of the joints, but there was pain on handling them. The pain in the joints disappeared in 48 hours. Then there was pain in the chest, endocarditis and temperature for three weeks. Small doses of the salicylate took all the pain away and she soon recovered. In November of the same year she had another attack. She could not then bear the salicylates on account of the severe abdominal pain, and she was given aspirin (acetyl-salicylic acid) in doses of gr. 2½, which relieved the pain very quickly. The endocarditis lasted about the same length of time that it did in the first attack.

DR. ARTHUR FAIRBANKS, Boston, referred to a case which had come under his observation. A boy, aged 11, had a history of having been struck in the stomach by another boy, 11 months previously. He did not vomit, but had severe pain, and was constipated. A week later "St. Vitus' dance" appeared, with "rheumatism" in all the joints. After 10 days in bed the pain disappeared, and he was allowed to get up. At the end of a week he had a slight relapse and chorea reappeared. It again improved, but he returned to the hospital the following spring, with the statement that the St. Vitus' dance was "bad again." He could feed himself, but could not button his clothes. Examination of the patient at this time showed that he held his head rigid and complained of pain on active or passive attempts to rotate or flex, the pain being referred to the posterior cervical region, where he complained of acute tenderness on pressure over the vertebræ. There was no tenderness over the muscles. Some tenderness was evident also in the dorsal region, but to a much less degree. There was complaint of pain and he winced when the vortex of skull was pressed downward, but there was no pain on jumping. In both wrists and in the metacarpophalangeal joint of the thumbs and in both knees there was pain of slight degree, but no swelling or redness. There was no swelling of the hands or tenderness; temperature was 101; heart was negative, except that there was slight prolongation of the first mitral sound. Choreic movements in upper extremities were very evident. On the supposition that rheumatism was the cause of the symptoms, he was given salicylate and bicarbonate of soda. Three days later all pain had vanished. He could then rotate and flex the head well, except some limitation in turning the head to the left. Chorea was still well marked. From that time on the salicylates were continued and movement in the head became perfectly free.

DR. WILLIAM J. BUTLER, Chicago, said that the proportion of cases in which there was endocarditis seems to him unusually large. It would be interesting to know how many cases of acute febrile conditions in which cardiac murmurs are heard, actually persist and remain as definite endocardial lesions. In chorea, which is so frequently associated with rheumatism, it is common to have systolic murmurs. It would be of interest to determine how many of these cases are really endocarditis and in how many the murmurs are accidental. It is probable that a considerable number are accidental, that disappear in the course of time, as may the

murmurs heard in various other acute conditions. The broken compensation referred to is usually dependent on one of two or three conditions; chiefly, when the pericardium is not affected, on the integrity of the heart muscle and the condition of its valves. In rheumatism there is no doubt that the myocardium frequently suffers as well as the endocardium, and a heart that has suffered an attack of endocarditis very frequently has also suffered more or less involvement of its myocardium, and as a result the occurrence occasionally of broken compensation, while it is referred to over-exertion, is really dependent on a prior myocardial involvement and a subsequent fatigue period; or, on the other hand, as stated by Dr. Dunn, it is frequently due to recurrent endocarditis in which the lesion existing is exaggerated or other lesions are added thereto.

DR. J. ROSS SNYDER, Birmingham, Ala., condemned the too free use of salicylates for all the uncertain conditions thought to be rheumatic. He thought that if all these symptoms should disappear, nothing has been proved, and salicylates are capable of a good bit of mischief.

DR. C. H. DUNN, Boston, said that the 77 cases of chronic endocarditis which he studied were not cases of acute infection. He did not see the clinical evidence of acute infection at the time of observation, but no doubt every one of them at some previous time was an acute infection. He did not have time to go into the matter of heredity, although a number of points on this were brought out. He studied the relation of chorea to rheumatism, but the figures did not give any very definite results. Many of the cases of chorea had cardiac symptoms in addition to the murmur, and those having an insidious development of cardiac murmur were carefully followed and showed in most cases a marked cardiac dilatation. He did not think there was much doubt that they were organic lesions. A point brought out was that the broken compensation was not the result of stenosis or insufficiency of the valve, as there are many cases in which cardiac symptoms develop before there is much stenosis, and many other cases in which there are no cardiac symptoms with rather marked stenosis. From these facts he is inclined to believe that the development of so-called broken compensation is due rather to an acute myocarditis accompanying an acute infection.

AUTOINTOXICATION IN RELATION TO THE EYE.

(*Continued from page 506.*)

DISCUSSION.

DR. CASEY A. WOOD, Chicago, is inclined to believe that as Americans we are affected by the danger of getting tired of a subject, and it has been thought by some that this subject has been settled. So far is this not true that he is of the opinion that this effort of Dr. de Schweinitz's will tend to explain a great many troubles in the eye that we know nothing about. While it is true that the autointoxication refers to changes that take place in the blood, that which leads up to it is important, namely, the changes that take place in the intestinal tract. Some six or seven years ago when the question was brought up about the probability that the so-called retrobulbar neuritis was not due to tobacco or alcohol, but to the secondary changes referred to by Dr. de Schweinitz, Dr. Turek was making some experiments on dogs, using the products of what might be termed indigestion, taken from the intestinal tract and injected into the blood. Fifteen per cent. of these dogs became blind and organic changes were found in the nerve head as well as in the eye itself. Dr. Wood thinks it legitimate still further to follow out these investigations. Any deductions to be drawn from experiments on the dogs, however, can not be applied to the human eyes, as they differ so widely. The observation is an interesting one, showing that there is some connection between autointoxication and eye diseases. Dr. Wood directed attention also to the probability that that class of cases known as primary optic nerve atrophy, not dependent on syphilis, is probably due to autointoxication. He thinks the work of Dr. de Schweinitz and Dr. Edsall points that way. We should have these experiments carried on, he said, with monkeys instead of dogs or guinea-pigs.

DR. CHARLES S. BULL, New York, said that little attention has been given to the possible connection existing between certain obscure diseases of the eye and intestinal autointoxication. There are certain cases, for instance, of chronic inflammation of the uveal tract, occasionally met, the etiology of which is either very obscure or entirely unknown. He has seen a number of such cases within the past three years, all cases of general uveitis, in which the gastrointestinal factor has been the sole contributing cause. In all these cases the posterior portion of the uveal tract was more seriously involved than the anterior, though iritis was present in all. In all of them indican was present in a large percentage in the urine, which Elschnig regards as the best test of disturbance in the intestinal canal; and the reabsorption of the products developed by its presence he considers gives rise to the toxemia, which causes various diseased processes in the eye, notably uveitis. In the obscure cases referred to there has been complete abscence of the usual etiologic factors. Dr. Bull agreed with Dr. de Schweinitz that the important point for us to recognize is the necessity of beginning a search from this standpoint, and the establishment of the dietetic and therapeutic regimen according to the indications which have been found. The examination of these patients should be made according to the best methods of modern physiologic chemistry, even when on the surface there seems to be no need of such exhaustive work. In the cases under Dr. Bull's care not the slightest improvement occurred until these exhaustive examinations were made and the dietetic and therapeutic regulations carried out according to the results found. Only then did improvement set in and vision was ultimately restored. This is particularly well illustrated in the case of a man recently under treatment. He presented himself with a general uveitis in both eyes and vision reduced to ten-two hundredths. He had been thoroughly saturated with mercury, potassium iodid and the salicylates before he came under Dr. Bull's observation. The fundus was very indistinct on account of the turbidity of the vitreous. The urine showed a high percentage of indican and the examination of the gastric contents revealed a chronic gastroenteritis. Under direct antiseptic treatment of the stomach and intestinal canal, flushing out the whole intestinal tract, followed by the administration of calomel, the vitreous cleared up and revealed numerous patches of pale yellow exudation in the choroid which slowly disappeared as the disease yielded to the treatment, and at the end of three months the media were perfectly clear, the exudation entirely disappeared from the choroid, and the vision was restored to normal.

DR. W. B. MARPLE, New York, agreed with Dr. Bull, and said that there is no other condition where the etiology has seemed to him more unsatisfactory than in uveitis. Dr. Marple has treated these patients with iodid of potassium, salicylate of soda, calomel, etc., and whether they got well because of the medicine or not it is difficult to say. The day after he read Dr. de Schweinitz's paper he had a patient, a child 15 years old, who had this uveal form of inflammation. The child was robust, with no specific history; vision was 20/100 in each eye; there was slight flush of the sclera and some opacities on Descemet's membrane. Dr. Marple had the urine carefully examined and the report was that there was marked excess of indican in the urine. He had never seen a case that has shown such improvement on the treatment—principally salines—based on the idea of intestinal intoxication.* He thinks that we are under great obligations to Dr. de Schweinitz for turning our ideas in the direction of the possible etiologic connection between this form of uveal inflammation and autointoxication. He believes that it is not at all unlikely that in cases of relapsing iritis the patients may have no specific disease, for these patients do better under the use of salines than under specific treatment.

DR. WILLIAM C. POSEY, Philadelphia, reported the case of a boy, aged 9, with paralysis of both ciliary muscles, who had been subject for a number of years to duodenal disease. The

* This patient was seen subsequent to the meeting (June 15), and the vision was 20/20, and the punctate keratitis had entirely disappeared.

symptoms came on after a rather active attack of indigestion. Indican was found in the urine. The cycloplegia cleared up after several weeks of treatment directed to the intestinal canal. Dr. Posey observed also, in connection with the delirium after operation on the eye, and which has been attributed by Fromaget to autointoxication, that about five years ago he reported twenty-four cases of delirium following eye operations. He observed at that time that autoinfection could scarcely have been the causal factor in any of the cases, as particular care was taken to eliminate this source of intoxication, both as regards diet and the opening of the bowels and the prevention of any retention of urine.

DR. WM. ZENTMAYER, Philadelphia, said that Francis Hare and Russell have recently called attention to the frequency with which spasms of the vessels occurs in beginning arteriosclerosis and have pointed out the benefit resulting from aiding in the elimination of waste products in migraine, epilepsy, etc. It has occurred to him, he said, that in monocular transient blindness, which is probably due to spasm of the central artery of the retina, autointoxication may be an exciting causative factor. It is of interest to note that in the case cited by Dr. Zentmayer the day before, there were no further attacks of spasm of the central artery of the retina after the intestinal tract had been flushed.

DR. JOHN E. WEEKS, New York, referred to two cases that have come under his observation within the last year. One was a case of optic neuritis and the other one of retinitis, which, in his opinion, were due to autointoxication. In both cases a careful examination was made of the urine and an excess of indican was found. These were cases from which syphilis or any constitutional taint that might have led to such development could be excluded, and the recovery was brought about by the use of intestinal antiseptics in addition to regulation of the diet.

DR. F. S. DE LUE, Boston, declared that he has been working along this line for several years. He has found that many of the cases that give trouble are due to autointoxication. Many of these patients come back complaining of discomfort, or perhaps go to some other oculist, who changes the glasses, making them a little weaker or a little stronger. He said that he could not agree with Dr. de Schweinitz that indican is the important thing to look for in the urine. He has been in the habit of having his patients examined very carefully, and believes that the trouble is due to uric acid. Many of these severe cases show no increase of indican. There may be no uric acid on the first test. The uric acid must be eliminated, then the symptoms pass off. He has seen cases of beginning optic atrophy, uveal trouble and nervous conditions immediately relieved by the elimination of what we call uric acid.

DR. S. D. RISLEY, Philadelphia, declared that at last the shades which have worried and made sleepless the nights of all practitioners from the early history of medicine down to the present time will be laid to rest and that we are finally to have a scientific statement instead. Ghosts which the practitioners of the sixteenth century and later attempted to lay by shedding rivers of blood; which our immediate predecessors tried to lay with calomel and jallup purges, we find are removed by calomel and soda followed by salines and intestinal antiseptics. His attention, he said, was first directed to this subject by a paper which Dr. de Schweinitz read at Washington and it was again emphasized and impressed on his mind by a practitioner who devotes himself to the study of diseases of the skin. Dr. Risley had a case of apparent herpes zoster frontalis, and the first question the dermatologist asked was about the intestinal tract, which elicited the information that there was an alternate diarrhea and constipation. He prescribed not only an alkaline purge, but an intestinal antiseptic immediately following it. The comfort to the patient and the speedy removal of the condition amazed Dr. Risley, and since then in all cases of uveal disease and many obscure conditions he has paid attention to this, and many cases have been cleared up by simply attending to the removal from the intestinal tract of the fermenting and decaying products of impaired digestion and faulty metabolism.

DR. EDWARD JACKSON, Denver, in reference to amblyopia, mentioned a case seen recently. A man, aged 58, had gradually decreasing vision for several weeks. The field of vision was not impaired, and there were no ophthalmoscopic changes. The case was referred to Dr. E. C. Hill, who found a diminution in the excretion of urinary solids, increased indican, and a moderate cardiac dilatation. The peripheral circulation was markedly impaired. Treatment brought the vision up from 4/22 and 4/15 to 4/8 and 4/5 in about two months. With reference to uveal diseases from autointoxication, Dr. Jackson said that he has now under observation three patients with chronic relapsing iritis who have had no serious attacks since placed on treatment for autointoxication under the care of intelligent medical men. Two of them are under such care constantly, while the third rather treats himself. In 20 years he had seven very severe attacks of iritis and innumerable slighter attacks. He always carried atropin, and full dilatation of the pupils stopped the slighter attacks. In the past four and a half years he has had no severe attack. His principal dependence in the latter period has been on absolute starvation for several days.

DR. JOHN GREEN, JR., St. Louis, cited the case referred to by Dr. de Schweinitz. A young woman, aged 30, had well-marked glaucoma simplex in either eye. The disease had begun about the age of puberty and had progressed in one eye to total blindness. In the other eye she still retained good central visual acuity (16/19) with a moderately contracted field. Both nerve heads were deeply excavated. Treatment with miotics was pushed vigorously, but vision gradually went off to 16/38, accompanied by a drawing in of the nasal boundaries of the field. Dr. Green said that at first the case did not appeal to him as one with a possible constitutional basis. Finally, however, a searching inquiry into the patient's general medical history revealed the fact that she had suffered from earliest childhood with an intractable constipation. The patient was referred to an internist, who ascribed the trouble to a congenital atonicity of the stomach and intestines, and instituted dietetic and electrical treatment. Concomitant with the improvement in intestinal function vision rose to 16/19 and later to 16/15, with increased ability to use the eyes, accompanied later by widening of the field. Dr. Green is inclined to the opinion that the prolonged resorption of noxious material from the intestinal canal gave rise to an optic neuritis which, through inherent weakness in the lamina cribrosa, resulted in excavation of the nerve heads.

DR. G. E. DE SCHWEINITZ, Philadelphia, stated that the difficulty of introducing a subject the knowledge of which is so limited is considerable, and his only desire has been to call the attention of the Section to a matter that is worth investigating, with the hope that obscure cases may be studied with this possible etiologic factor in view. With reference to the remarks that have been made in regard to uric acid and the uric acid diathesis, he said that this has nothing to do with the subject. His only purpose was to study the possible relationship of autointoxication to obscure ocular complaints, and to suggest that the presence of persistent indicanuria may be an indication, as Elschnig has insisted, of enterogenous decomposition products. He repeated and emphasized his conclusions in regard to this matter. We do not know, he said, the entity of a single autointoxication except the acidosis of diabetic coma, and we know that no known autointoxication is to be attributed to any known end-product of any known metabolism (quoting from Alonzo Taylor), but we do know from clinical analogy that autointoxications exist, even if their true nature is as yet a secret. There is reason to believe, in the absence of other causes, that ocular troubles may arise, largely in the corneo-scleral and uveal tracts, and probably, in so far as the nervous apparatus is concerned, in manifestations to which we apply the terms acute or chronic retrobulbar neuritis, which may be etiologically related to toxins elaborated in the intestinal tract. It is not at all certain, Dr. de Schweinitz said, that such toxins are the only and sole causes of these conditions, but at least investigations thus far indicate that they may be considered accessory causes, and, as Edsall and he have tried to show, they may play a certain part in the production of the symptoms and at times are probably the direct cause of their continuance, even where other more commonly accepted etiologic factors have ceased to be active.

Therapeutics

[It is the aim of this department to aid the general practitioner by giving practical prescriptions and, in brief, methods of treatment for the diseases seen especially in every-day practice. Proper inquiries concerning general formulæ and outlines of treatment are answered in these columns.]

Prophylaxis of Typhoid Fever.

(*Continued from page 450.*)

Following this discussion of sources of infection Thayer concludes that prophylactic measures which should be adopted may be grouped into two general classes:

1. PREVENTION OF INFECTION OF THE PATIENT.

This may be accomplished by:

Protection of the Water Supply.—In towns the relation of the well to the house and to other structures should, of course, be carefully considered. In the city the surroundings of the source of supply should be carefully cleared up and installation of filtration plants which have been tested and passed on by disinterested scientific experts is an unquestioned necessity for all our large municipalities if we wish to protect our citizens and to keep pace with the progress of the world. The water supply has an undoubted relation to the urban prevalence of typhoid fever.

The necessity of conscientious and general boiling of water, if the supply be suspicious, is familiar enough to all. Reasonable care should be observed with regard to the eating of all contaminable foods, and unsterilized milk from uncertain sources should be shunned. The more general use of mosquito netting as a sanitary measure should be encouraged. Special measures should be adopted to keep flies away from food in kitchens, pantries, and on the table.

The construction of sanitary water-closets or outhouses is an important though most difficult matter in the country. Every measure should be taken to preserve the dejecta from exposure to flies. Tight spring doors should be provided, and all windows and openings should be netted.

It is of the utmost importance to remember that typhoid fever is a contagious disease. He who comes in any way in contact with the patient can not be too careful. Dirty hands are often the agents of infection, not only to the individual, but of food, and may serve to spread the disease. Preventive inoculations in time of epidemic in armies or among attendants in fever ward may be carried out.

2. PREVENTION OF THE ESCAPE OF THE INFECTIOUS AGENT FROM THE PATIENT.

The point of greatest importance, however, in the prophylaxis against typhoid fever consists in the prevention of the escape of bacillus from the human being into the external medium. The problem is no way different from that in cholera, yellow fever, plague and tuberculosis.

To prevent the escape of typhoid bacilli from the infected individual demands the concerted efforts not only of the individual physician, but of local, state and national departments of health. To carry out thorough and complete measures would involve the establishment of hygienic stations throughout the country, systematic examination of the dejecta, stools and blood in suspicious cases and, more than this, examination of healthy individuals in the immediate neighborhood. It would involve keeping the typhoid patient under supervision for a long period of time after his convalescence, as is now done in cases of diphtheria. Usually the typhoid patient ceases, in the great majority of cases, to be a danger to the community at the end of his convalescence. Proper sterilization of everything which may be contaminated by the patient should be insisted on. The following measures, the author states, have been admirably summarized by Cole:

Protection of the Patient from Flies.—This is an extremely important point. It would be far better if typhoid patients were isolated in separate rooms or wards, not only on account of the danger of transmission of the infectious agent by means of flies, but because of the influence which it would have on the attendants in stimulating them to carry out the necessary rules of precaution better than is now commonly done. It would be well if the medical and general public realized more fully that typhoid fever is a contagious disease. The ward or room should be thoroughly protected by fly-screens, or the patient should be continually covered by a netting.

(*This subject will be continued.*)

Incipient Tuberculosis.

Twitty states that he has given the following method of treatment a very careful and extensive trial and that he has no hesitation in recommending this special plan of treatment in incipient tuberculosis. The wide experience not only of himself but of other reputable physicians has put this method of treatment beyond the experimental stage. The following is the original prescription:

℞. Iodi ..... gr. x-xxx |60-2.00
Carbonei disulphidi ..... f℥i 30|

Put from 5 to 10 drops on the gauze in an antiseptic (glass) inhaler and inhale through the mouth and exhale through the nostrils. Inhale from three to five minutes, slowly at first; repeat from three to six times a day, depending on the physical condition as well as on individual idiosyncrasies. Indications: respiratory inflammation, including incipient tuberculous disease.

It is needless to add that this inhalation is not independent of such valuable agents as open air and hygienic measures as may be indicated. As to other medicines or foods, crude cottonseed oil may prove one of the best flesh builders.

The following aromatic modified formula may sometimes be useful:

℞. Iodi ..... gr. x-xxx |60-2.00
Mentholi ..... gr. x |60
Olei gaultheriæ ..... m. xxx 2|
Carbonei disulphidi ..... f℥iv 15|

M. et ft. sol. Sig.: Use as directed above.

Intralaryngeal Injections.

W. G. B. Harland, M.D., Philadelphia, states that intralaryngeal injections are of great value in certain cases, but if used as a routine measure they will lead to disappointment. They should be reserved, he declares, for patients who have failed to receive benefit from other modes of treatment, and used in this way will often surprise and please the physician by the beneficial results that follow.

The injections are of value in chronic spasmodic affections such as dry racking cough and asthma, and in cases with tenacious, abundant or fetid expectoration, as in chronic bronchitis, bronchorrhea and tuberculosis. He has found the following useful in these conditions:

℞. Mentholi ..... gr. v |30
Creosoti ..... gtt. v |30
Olei olivæ or petrolati liq. ..... f℥i 30|

M. Sig.: Warm and inject one or two drams into larynx daily, every other day or biweekly. Iodoform, gr. xv (1.00) may be added in tuberculosis of lung or pharynx.

Any syringe may be employed for making injections, provided it has a curved canula long enough to reach beyond the epiglottis. No local anesthesia is required. The laryngeal mirror holds the soft palate out of the way and gives a view of the larynx, or perhaps of the epiglottis only. The patient holds the breath while the injection is being given and takes a deep inspiration immediately afterward. Of course, much of the fluid is swallowed, but enough enters the larynx to produce results. These injections cause surprisingly little trouble to either physician or patient.

Tuberculous Laryngitis.

Bane writes on this subject in the *Colorado Medical Journal* and recommends the use of formalin applied locally as follows: Apply the formalin with a swab to the affected part in a comparatively strong solution (from 1 to 500 and 3 to 100). In most cases the formalin, in strong solution, should be preceded by the application of a from 5 to 10 per cent.

solution of cocain or beta-eucain. A 3 to 5 per cent. solution of formalin has a decidedly beneficial action on ulcers of the larynx, he says, and may be applied to granulations about the epiglottis and vocal cords. It causes shrinking and hardening of the tissues, thus encouraging fibrous changes.

Medicolegal

Waiver by Heir—Urethritis and Mental Condition.

The Supreme Court of Michigan says that, in the case of Sibley vs. Morse, a physician was called as a witness for the purpose of showing the mental capacity of a testator at the time two codicils to his will were executed in 1901. On cross-examination the physician was asked in regard to having treated the testator for urethritis in 1890. This testimony was excluded on objection. It was contended that the testator's son, as heir at law, might waive the statute protecting the patient from the discovery of facts learned by the physician while treating him. But whether the heir can, against the protest of the legal representatives (as executors, etc.), waive the right the court does not decide, on the ground that it was not necessary to do so in this case. It says, however, that there is authority supporting the contention that he may. Thompson vs. Ish, 99 Mo. 160. The reason it gives why it was unnecessary to decide this question here was that in any view of the case it thinks that the testimony in question was too remote to be of any value in determining the mental condition of the testator from eight to ten years later, and that no error was committed in its exclusion which prejudiced the rights of the contestant.

Court, Not Witness, to Determine as to Latter Being an Expert.

The Kansas City Court of Appeals says that in the personal injury case of Spaulding vs. City of Edna, the plaintiff introduced as a witness a physician who testified that he was a graduate of a medical school and had practiced medicine and surgery for about nine years. The trial court admitted him to testify as a medical expert. On cross-examination he stated that: "I am 33 years old. I am a general practitioner to some extent. However, I give more attention to surgery. I do not claim to be an expert on the subject of nervous diseases." As the evidence proved that the plaintiff was suffering from a nervous disease, the defendant moved the court to strike out the physician's evidence, which the court refused to do. The action of the court in this respect was assigned as error. But the Court of Appeals thinks that it must be conceded that the court is the authority to determine whether a witness is an expert, and not the witness himself; otherwise, the witness would be clothed with a judicial function. Notwithstanding the utter absurdity of such a contention, it seems the courts have been called on to pass on it, as will be found in Langston vs. Southern Electric R. R., 147 Mo. 457; Thompson vs. Ish, 99 Mo. 160. Whether the witness considered himself an expert on nervous affections, although a matter to be taken into consideration by the court in order to determine his competency as such, was not conclusive of the question any more than if he had said he was such. The question was a matter for the court to determine on all the evidence introduced as to his competency in that respect.

Illegality of Contract to Marry Consumptive.

The Supreme Court of Washington says that the case of Grover vs. Zook was brought by a woman to recover damages for a breach of contract of marriage. The principal defense urged by the defendant was that the plaintiff, at the time of the mutual promises of marriage, was afflicted with pulmonary tuberculosis, in an incurable form, and had ever since been physically incapable of entering into the marriage relation. It was the contention of the plaintiff that this condition of hers constituted no defense to her action, for the reason that the defendant knew thereof at the time he promised to marry her. It was admitted by her that she was afflicted with this disease at the time the engagement of marriage was entered into, although she claimed that she did not know at that time that the malady affecting her was consumption. There was a conflict in the evidence as to whether or not the defendant knew of the character of her illness at the time of the engagement. He swore that he did not. The trial court ruled on the evidence and instructed the jury on the theory that the defendant was liable for a breach of agreement if, at the time of the making thereof, he knew the character of the plaintiff's ailment. The result was a verdict and judgment for the plaintiff.

The Supreme Court, in reversing that judgment, with instructions to dismiss the action, says that the question presented was: Did the defendant under the circumstances have a legal right to disregard the promise of marriage he had given the plaintiff? In the domain of morals it is a maxim that a bad promise is better broken than kept. Moral considerations must have a predominating influence on such a question as now confronts us. In fact, they constitute the reason, the basis and the life of the law applicable in a case of this character. The most profound philosophers join with the wisest statesmen in maintaining the proposition that the home is the unit of the state, and that the character of a people and the stability and welfare of the nation must largely depend on the healthful and wholesome influence of the home life. By reason of this we find the home and the members thereof, especially the young and dependent, sheltered by the protecting care of various statutes, all being evidences and expressions of that public policy which deems the home and its inmates appropriate objects of the solicitude and care of the state. The paramount consideration involved in the determination of this case is not that appertaining solely to the parties to this action (although as to each of them it is of great importance), but it is as to the community, the state and to humanity in general.

Here we have a man and woman engaged to be married. The man is of a family several members of which have died with pulmonary consumption. The woman is afflicted with the same disease to such an extent that it becomes necessary for her to go to a distant portion of the country to recuperate, which she does, returning with the affliction still on her and with small, if any, assurances of recovery. Under these circumstances, if the marriage were to be consummated, what would be the natural consequences to be anticipated?

Unconditional promises of marriage, exchanged by a man and woman, imply, respectively, that each is physically, morally and legally competent to enter the status of matrimony, and capable, in so far as he or she knows or has reason to believe, of effectuating the principal purposes of the marriage relation. One of the most important functions of wedlock is the procreation of children. Offspring are the natural result, and ofttimes the chief purpose, of marriage. That the thought of bringing a child into the world should be one of the most serious that can engage the mind of a human being needs but to be suggested. Born amidst the most favorable environment, there lies before every babe a life of uncertainty so great that no worthy parent may contemplate it without a tremor of apprehension. Thus launched on the sea of time and eternity, what parent can dwell on the birth of his child without the keenest sense of anxiety and responsibility? If the child born in health and with a body of vigor be a matter of deep concern to a parent, what must be said of the advent of a babe burdened with the hereditary plague of consumption?

That pulmonary tuberculosis is both contagious and hereditary as well as infectious admits of little, if any, doubt. That a mother seriously ill with that disease and a father with a hereditary taint thereof in his blood could bring forth a child exempt therefrom is unbelievable. For parents thus afflicted to bring into the world a child would be not only detrimental to the welfare of the state and an offense to the instincts of humanity, but it would be, as against the innocent babe, a moral wrong most abhorrent. Such a child must of necessity be a burden to itself and others and devoid of the joys and blessings that make life endurable. In declining to carry out his promise of marriage, it may be presumed that the defendant apprehended the natural and legitimate con-

sequences of such a union. In addition to the thought of progeny there would be also that of the aggravation of the disease as to both himself and prospective wife, the medical expert evidence showing that the intimate association of married life would tend to augment the ravages of the malady on each.

The apprehension felt by the people of this state from the disease under consideration is evidenced by a statute enacted by the legislature in 1899, entitled: "An act to prevent the spread of tuberculosis," etc., section 5 of which reads: "It is hereby made the duty of every person having tuberculosis and of every one attending such person, and of the authorities of public and private institutions, hospitals or dispensaries, to observe and enforce the sanitary rules and regulations prescribed from time to time by the boards of health of such cities and of the state for the prevention of the spread of pulmonary tuberculosis." Other statutes exist, having for their purpose the prevention of the spread of this and other contagious and infectious diseases. The enforcement of certain rules and the distribution of literature giving information as to the prevention and treatment of such cases is enjoined on boards of health and others.

In the face of legal restrictions and requirements of this character, it is difficult to understand how a man or woman afflicted with this plague may legally insist on the fulfillment of a promise of marriage, which, if consummated, would endanger the health and life of both and blight the life of any offspring that might be born. Any person entering marriage, knowing himself to be seriously afflicted with pulmonary tuberculosis, violates the spirit, if not the exact letter, of the statutes enacted to prevent the spread of that disease. The same is true of one who marries another knowing him or her to be thus afflicted. An agreement which, if executed, would thwart the beneficent purpose of such statutes, ought not to be held binding.

Counsel for the plaintiff cited cases where a man, promising to marry a woman whom he knew to have been formerly unchaste, was held to be bound by such promise. Such a case and this are not analogous. There the man by his promise overlooks the former shortcomings of the woman, and it is a matter concerning him only. She would have the ability to, and presumably would, reform and become a good wife and worthy mother. This is to the advantage of society, and not inconsistent with sound public policy, and the law should interpose no hindrance thereto.

But a consumptive woman is physically incapable of becoming a healthful companion or the mother of healthy issue. It is not a condition that she voluntarily created nor can change at will. The evils to follow her marriage could not be confined to herself and husband, but must of necessity concern and injuriously affect others. The nature and natural sequences of a contract of marriage are such that the state is of necessity a third party to, and interested in, every such agreement. Its interests forbid the enforcement of such a contract between parties physically incapable of making the married state beneficial to themselves or to society.

The court is not disposed to take into consideration any matters personal only to the defendant. If he knew of the nature of the plaintiff's ailment when he agreed to marry her and agreed to make her his wife, notwithstanding the same he ought not to escape responsibility by reason of any inconvenience affecting only himself. But the interests of the community and state step in, and, with the dictates of humanity, demand that no human compact shall be upheld that has for one of its principal objects the bringing into the world of helpless, hopeless, plague cursed, innocent babes. The court can sanction the breaking of a promise and relieve from the terms of a deliberate agreement only when the alternative involves results more deplorable. Had these parties married it is inconceivable that any of the important ends of marriage could have been attained. It is morally certain that sickness, grief and sorrow must have been the sequence of such a union. These considerations,, with the possibility and probability of issue afflicted with this terrible malady, constrain this court to hold that the marriage agreement was not binding—that it was the privilege of either party to withdraw therefrom.

Current Medical Literature

AMERICAN.

Titles marked with an asterisk (*) are abstracted below.

Boston Medical and Surgical Journal.

January 24.

1 *Acute Hematogenous Infecton of One Kidney in Persons Apparently Well. F. Cobb, Boston.
2 *Cirrhosis of the Liver in Infancy in Connection with Congenital Obstruction of the Bile Ducts. J. L. Morse, Boston.
3 *The Professional Trainer's Theory of Training. E. H. Nichols, Boston.
4 *Medical Aspects of Athletics in Preparatory Schools. J. B. Blake, Boston.
5 Medical Knowledge of Shakespeare. A. C. Getchell, Worcester, Mass.

1. **Hematogenous Infection of Kidney.**—Cobb reports a case of this kind occurring in a woman, 45 years old, married, mother of three children, who had always been well until the present trouble developed. Pain in the right side of the abdomen, with some muscle spasm and tenderness most marked over the region midway between the appendix and liver were the only important signs. There were some leucocytosis, some albuminuria and considerable pyuria. The pain gradually localized itself in the region of the right kidney where it was possible to palpate a mass. The kidney was exposed and was found to be enlarged to about twice the normal size. It was dark colored, and on its surface were four areas about half an inch in diameter, dark, looking like spots of infarction. All these areas were soft and seemed to contain old blood clots with some broken down kidney tissue. Otherwise the kidney appeared normal, except for its color. Cultures from these areas gave a pure growth of colon bacilli. The capsule of the kidney was split posteriorly and small gauze wick drains were pushed well down into each softened spot. There was entire cessation of pain and convalescence was rapid. The patient has remained well. Cobb discusses the subject further from a pathologic as well as from a clinical standpoint.

2. **Cirrhosis of Liver in Infants.**—Both of the patients whose histories are reported by Morse and Murphy died shortly after they were operated on. The first patient was three and a half months old; the second patient was fourteen weeks old. In both cases there were found at autopsy cirrhosis of the liver with slight chronic splenitis and retention and inspissation of bile pigment, and dilatation of the bile capillaries.

3. **Training.**—While endeavoring to secure a man to train the members of a football and baseball team, Nichols had occasion to interview personally ten professional trainers. He found an utter lack of accurate basis for training. The whole thing, he says, comes down to a very indefinite general impression, plus the indication shown accurately by the weighing scales. The science of training is very indefinite and crude. The most valuable trainer, is probably, the man who knows human nature, especially the nature of young men best.

4. **Medical Aspects of Athletics.**—Blake says that in the establishment of subsidiary sports, in the far more strict supervision of the older sports, in the introduction of walking in its various forms, and in the personal interest of the parent, the teacher, the doctor and the coach in the schoolboy's play and in his work, lies the restoration of school athletics to its proper position—a position of great importance, a source of much pleasure, and more health, a potential moral influence and an essential educational factor.

New York Medical Journal.

January 26.

6 *Management of Laparotomy Patients and their Modified After Treatment. H. J. Boldt, New York.
7 *Blood Examination in Surgical Diseases. F. E. Sondern, New York.
8 *Treatment of Chronic Urethral Discharges. S. L. Gans, Philadelphia.
9 The Physician's Relation to the Social Evil. E. W. Ruggles, Rochester.
10 *Immediate and Remote Consequences of Cranial Injuries. (Continued.) H. Cushing, Baltimore.
11 Gonorrhea of the Mouth. S. M. Hyman, New York.
12 Empyema of Accessory Sinuses of the Nose, Complicated by Orbital Abscess. J. Guttman, New York.

6.—See abstract in THE JOURNAL, Jan. 12, 1907, p. 161.

7. **Blood Examination in Surgical Diseases.**—Sondern finds that blood examinations in surgical diseases are an aid in determining the general state of health before or after surgical procedure and an aid in the diagnosis of conditions inducing lesions subject to surgical intervention or those complicating surgical diseases or their convalescence. They furnish information for differential diagnosis; they lend aid in determining the degree of depletion due to hemorrhage, and, finally, they present evidence of decided value in determining the presence or absence of an inflammatory lesion, and in the former event they may indicate the degree of toxic absorption and the resistance offered by the animal economy toward this infection. He says that a complete blood examination gives satisfactory evidence as to the patient's condition and power of resistance.

8. **Treatment of Chronic Urethral Discharges.**—In the course of this lecture, Gans answers affirmatively the question of whether or not a stricture can be cured permanently. He says that this can be accomplished by passing a full size steel sound once a week for at least six months.

10. **Cranial Injuries.**—The second case reported by Cushing was one of penetrating stab wound of the skull, with subcortical, postcentral hemorrhage, contralateral sensory disturbances and visual word blindness. The clot was evacuated, and the cortex subjected to faradization with the result that there was a rapid disappearance of all symptoms, except astereognosis.

Medical Record, New York.

January 26.

13 Reminiscences of Medical Practitioners in New York During the Period of the Early History of the Academy. A. Jacobi, New York.
14 *The House Fly and Its Connection with Disease Dissemination. G. K. Dickinson, Jersey City.
15 Physiologic Action of Massage. G. Norström, New York.
16 *Proprietary Medicines. B. Robinson, New York.
17 *Unusual Nidus for Gonococcic Infection. E. G. Ballenger, Atlanta.
18 *Ten Years a Nasal Patient. F. K. MacMurrough, Jersey City.

14. **House Fly and Disease.**—Dickinson states that the importance of flies as a factor in the dissemination of disease depends largely on existing conditions. Scientifically speaking, the number of flies in a community is in direct proportion to the carelessness of its sanitation. The greatest care should be taken to destroy as many of these insects as possible, and to protect houses and their contents from those that remain.

16. **Proprietary Medicines.**—Robinson believes that nearly all the proprietary medicines are humbugs, and that many people are fond of mystery and like to be deceived. The greatest sinners in regard to this evil, he says, are the manufacturers and men of authority in the business world who place their signatures at the bottom of circulars praising these medicines, about which they know nothing. There are certain cases in which if the character of the firms selling these medicines is reliable and if the printed formula seems unobjectionable or desirable for a certain case, such drugs may properly be prescribed. The sale of proprietary medicines can be stopped, he declares, by never sending the patient to any drug store unless it is known to be reliable; and by never prescribing any particular mixture unless it contains exactly what is called for.

17. **Unusual Nidus for Gonococcic Infection.**—Ballenger's patient contracted gonorrhea and was supposed to have been entirely cured. After treatment, erosions, which had been produced, healed, except in a small pocket on each side just behind the cornea and under the edge of the adherent part of the prepuce. Profuse purulent secretion from the small pockets was started by overexertion. The pockets were found to be the foci of infection. The adhesions which existed were broken up, and the patches cauterized with nitric acid. No further recurrence has been observed for three months.

18. **Ten Years a Nasal Patient.**—MacMurrough describes the benefits which he has experienced from a submucous operation which was performed on his nasal septum. He had for ten years suffered with catarrhal and obstructive symptoms in the nose and throat. At this operation considerable cartilage and bone were removed. During the subsequent year he was in better health than he had been for years before, but he did not consider himself cured. In consequence, a second submucous operation was performed, and at this time a high bony ridge, reaching nearly to the roof of the nose, was taken out. Since that time he has experienced the desired relief.

Journal of Missouri State Medical Association, St. Louis.

January.

19 *Intestinal Obstruction from Tuberculous Peritonitis. R. Hill, St. Louis.
20 Pericarditis with Effusion. W. J. Calvert, Columbia, Mo.
21 Percentage Modification of Milk for Infant Feeding. G. C. Mosher, Kansas City, Mo.
22 *Treatment of Hemorrhoids. W. H. Stauffer, St. Louis, Mo.
23 *Ano-Rectal Fistula. J. D. Potts, St. Louis.
24 Arteriosclerosis. T. Brown, Hamilton, Mo.
25 Infant Mortality and Infant Feeding. H. M. Mixer, Neosho, Mo.
26 *Method of Operating in Inguinal and Femoral Hernia when Complicated by Abscess. H. E. Pearse, Kansas City, Mo.
27 When is Operative Interference Contraindicated. F. H. Brunig, Kansas City, Mo.
28 The Country Doctor and Appendicitis. M. P. Shy, Knob Noster, Mo.
29 Etiology and Cure of Hysteria. F. Walter, Perry, Mo.

19. **Tuberculous Peritonitis.**—Hill reports a case of fibrous tuberculous peritonitis leading to complete obstruction of the intestine with the formation of a large mass, distinctly discernible from the outside of the abdomen, which at the operation proved to be an agglutination of the coils of the small intestine. These were separated and the abdomen was closed without further exploration of the cavity and without drainage. The symptoms of obstruction passed away at once, and the patient made a rapid and uneventful recovery. Since that time, now over nine years, the patient has been perfectly well. A second case reported by Hill is one of intestinal obstruction consequent on tuberculous peritonitis in which, at the operation, there was found in the ileo-cecal region a very peculiar looking mass about 7 inches in length and four in thickness, which was covered with cicatricial tissue. The mass consisted of several coils of the lower portion of the ileum. It was excised and an end-to-end anastomosis was made. The excised mass consisted of thirty-three inches of ileum and at its middle was a structure extending completely around the lumen. The Murphy button used to make the anastomosis had to be removed six weeks after the original operation owing to the onset of obstructive symptoms. The diagnosis in this case was tuberculous peritonitis.

22. **Treatment of Hemorrhoids.**—The operations discussed by Stauffer are excision, clamp and cautery, and the ligature operation.

23. **Ano-Rectal Fistula.**—In discussing the treatment of this condition Potts says that the sphincter should not be incised whenever this can be avoided. If the mucous membrane has not been penetrated and the integrity of the sphincter remains unimpaired, Potts does not make any incision through the muscle. He says that good drainage can be established and maintained without taking any chances on having a case of fecal incontinence to harass the patient the remainder of his life. With the spiral-douche currette Potts scrapes the walls of the fistulous tract, removing all shreds and infectious material. After the tract is perfectly clean, he proceeds as follows:

A piece of heavy rubber drainage tubing, with lumen of from one-fourth to three-eighths inch in diameter, and from four to six inches in length, is introduced into the rectum. About two inches of this tube are left projecting from the anus. Around the portion within the bowel is carefully packed a sufficient amount of gauze, which has been previously saturated with warm sterile vaseline, to fill the rectal canal. Around the projecting end is wrapped sufficient gauze to make a roll one inch in thickness, and this is held in place by threads passed through from the inside tube. Gauze is now placed around the roll to support it, and the whole is carefully held in position by a carefully adjusted T bandage. Perfect coaptation of the sinus wall is thus secured under pressure, and agglutination results in from three to five days. The tube allows the escape of the gases—if necessary, the escape of fecal matter, and the pressure from above, from below, and from within holds the previously divided sphincter in a condition of rest. The tolerance of

the mucous membrane and sphincter is something remarkable. Sometimes the tube will remain in position for several days without exciting irritation. According to Potts, this mode of treatment is applicable to almost any type of fistula, except those which connect some other organ with the rectum.

26. **Hernia Complicated by Abscess.**—Pearse opens the abdomen directly above the hernia, if inguinal or femoral, and beside it if ventral or postoperative, either below or above if umbilical. In any case, sponges and gauze pads are carefully packed about the ring thus shutting off the abdomen securely from infection. The operator then turns his attention to the abscess. The hernial sac is opened by a small incision only large enough to allow inspection and drainage. The pus is removed and the cavity flushed with 0.5 per cent. formalin solution. The edges of the abdominal incision are protected by sponges. The ring is opened and the inflamed bowel drawn into the abdominal cavity on the sponges arranged to receive it. If the content of the sac be omentum instead of bowel it is not withdrawn but ligated and cut off and the end removed through the hernial incision. The ring is firmly closed from within the abdomen and covered by a second layer of peritoneal sutures. The abdominal wound is closed whenever the structures concerned in the hernia are properly treated, cleaned and prepared for replacement within the abdomen, and the protective sponges are removed. The external wound and hernial cavity is best packed with gauze and forced to heal by granulation.

Journal of Infectious Diseases, Chicago.

January.

30 *Stomach Lesion in Guinea-Pigs Caused by Diphtheria Toxin and Its Bearing on Experimental Gastric Catarrh. M. J. Rosenau and J. F. Anderson.
31 *Noma: Gangrenous Stomatitis, Water Cancer, Scorbutic Cancer, Gangrena Oris, Gangrene of the Mouth. G. H. Weaver and R. Tunnicliff.
32 *Virulence of Diphtheria Organisms in Throats of Well School Children and Diphtheria Convalescents. M. E. Pennington.
33 Relation of the Bacillus Mucosus Capsulatus Group to Rhinoscleroma, and of Various Members of the Group to One Another. R. G. Perkins.
34 *Spontaneous Phagocytosis of Fusiform Bacilli and Influenza Bacilli. R. Tunnicliff and D. J. Davis.
35 *Hemophilic Bacilli—Their Morphology and Relation to Respiratory Pigments. D. J. Davis.
36 *Pathogenicity of Streptococcus Lacticus. P. G. Heinemann.
37 *Study of Pneumococcus, with Especial Reference to the Inulin Test. J. L. Berry.
38 *Latent and Recurrent Malarial Infection and the Significance of Intracorpuscular Conjugation in the Malarial Plasmodia. C. F. Craig.
39 *Virus and Means of Transmission of Rocky Mountain Spotted Fever. H. T. Ricketts.

30. **Artificial Gastric Ulcer.**—Rosenau and Anderson describe the production of gastric ulceration in guinea-pigs injected with fatal quantities of diphtheria toxin. In the early stage there are congestion and hemorrhage followed by ulceration if life is prolonged from two to four days. The lesion occurs at or near the pylorus, and is found in about 50 per cent. of the animals dying within twenty-four hours, and in 75 per cent. of those dying between the third and fourth day after injection.

31. **Noma.**—Weaver and Tunnicliff review the literature on noma from the time of Hippocrates to the present, discussing the frequency of its occurrence and its clinical history. They summarize their findings in the necrotic cheek tissue as follows: 1. There is some leucocytic invasion, but no well-marked zone of demarcation. 2. The fusiform bacilli and spirilla are similar to those seen in the smear preparations made from the nose and mouth before death and from the necrotic tissue of the face immediately after death. 3. Both forms are present in both the necrotic and the living tissue, the spirilla forms apparently being in excess in both places. 4. The thrombosed vessels contain fusiform bacilli, filaments and spirilla. They believe these organisms are the threaded and spiral forms of one organism which correspond with forms shown by them to occur in pure cultures of fusiform bacilli.

32. **Virulence of Diphtheria Bacilli.**—Pennington found that among well school children approximately 10 per cent. harbor in their throats bacilli which correspond morphologically with the organisms of diphtheria. One-half of these organisms were without effect on guinea-pigs; about 30 per cent. behaved like attenuated forms; and 14 per cent. killed the animals with a fair degree of promptness. Of 25 strains of diphtheria bacilli obtained during the last days of convalescence, 23 were highly virulent and only 2 without virulence. One case gave a virulent organism on the eighteenth day and a non-virulent one on the thirty-fifth day. The author concludes that: 1. The organisms found in the throats of well persons who have not been exposed are, in the majority of cases, without virulence; but even these are occasionally responsible for a true diphtheritic infection. 2. The organisms in the throats of many well, exposed persons possess marked virulence and are responsible for more infections than organisms from well, unexposed persons. 3. The organisms in the throats of patients convalescing from true diphtheria are very virulent, and may be disseminated so long as they remain in the throats, which period may far exceed the duration of the clinical evidences of the disease. The one safe course in regard to patients convalescing from diphtheria, therefore, is to forbid their association with non-immunes so long as the laboratory findings are positive, no matter how well the patient may appear clinically. The course which should be taken in regard to the well persons not exposed to diphtheria who carry bacilli, is not so clear. To quarantine such a number would be impractical; yet the bacteriologist must insist that, in the absence of definite evidence to the contrary, the organism which is harmless and attenuated in the throat of a well individual, may, if planted on another throat under different conditions of susceptibility, so increase in virulence that its specific disease is produced. This increase in virulence is admitted to be infrequent.

34. **Spontaneous Phagocytosis.**—Tunnicliff and Davis find that phagocytosis of fusiform bacilli and influenza bacilli is as active in the presence of normal salt solution as in the presence of serum. They washed the leucocytes from five to seven times to remove the serum. Dead bacilli were taken up to the same extent as the living, showing that growth of the organism did not cause the increase in the number which occurred after a few hours. Different percentages of salt solution were used. With the fusiform bacilli no difference in the number of bacilli ingested was observed until 2.5 per cent. solution was employed, when phagocytosis ceased. Varying concentrations of salt solution between 0.6 and 1.3 per cent. had no effect on the phagocytosis of influenza bacilli.

35. **Hemophilic Bacilli.**—Davis concludes as follows: Various strains of hemophilic bacteria isolated from different conditions can not be differentiated on morphologic grounds. They can utilize in the growth hemoglobins from various warm and cold-blooded animals and also from fresh-water and marine forms, but they are not able to utilize other respiratory proteids, e. g., hemocyanin, hemerythrin, echinochrom. Davis finds that an extremely small amount of hemoglobin in the media (1 part in 180.000 parts of media) is sufficient for the development of these bacteria. No satisfactory cultural results have been obtained with any substance other than hemoglobin. The bacilli do not grow in the presence of hematin.

36. **Pathogenicity of Streptococcus Lacticus.**—Heinemann, in an examination of five strains of *Streptococcus lacticus*, obtained from different samples of milk, concludes that the organism is able to become very virulent by prolonged habitation in the body of the rabbit, and that it may approximate, if not equal, the virulence for this animal of typical *Streptococcus pyogenes* from human affections. The lesions produced are of the same kind and extent as those produced by *Streptococcus pyogenes* from lesions in human beings. By repeated passages through rabbits the virulence of *Streptococcus lacticus* is gradually increased.

37. **Study of the Pneumococcus.**—Berry examined 63 strains of pneumococcus with a view of determining the value of the identification of pneumococci by coagulation of inulin ox-serum water. Of these strains, 27 were obtained from cases of pneumonia, 23 from normal individuals, and the rest from miscellaneous cases. Some of the strains were cultivated on artificial media for a year or more; and it was observed that after variable periods of cultivation decided changes in morphology, virulence and power to ferment inulin occurred. The pneumococci morphologically approached a streptococcus type. Virulence, diminished by artificial growth, increased rapidly

by animal passage. A large number of negative tests to inulin coagulation were given by typical pneumococci, and many coagulations were obtained with cultures of a streptococcus type. Great variations were found between different stocks of inulin powder and even between different lots of medium made from the same powder and inoculated with the same strain. Factors which increased the chances of a positive test were the use of strong emulsions of organisms and animal passage. The chief conclusion is that while coagulation of inulin is valuable corroborative evidence in favor of pneumococcus, yet no organism can be rejected as a pneumococcus because of one or even several non-coagulating inulin cultures, especially if they have been grown for some time on artificial media.

38. **Latent and Recurrent Malarial Infection.**—Craig, in observations of 1,653 cases of malarial infection in United States soldiers and Filipinos, discovered that a little over 25 per cent. were latent infections, i. e., those in which the plasmodia of malaria may be demonstrated to be present in the blood without clinical symptoms of sufficient gravity to attract attention. Of these cases a large number were found in soldiers in San Francisco who had returned from the Philippines, and nearly all were of the estivo-autumnal type. He considers this to be of extreme importance as showing the possibility of the spread of malaria in this country by returning soldiers. The number of cases of infection in native children decreased as their ages advanced. In children under 5 years, 51.8 per cent. showed the parasite in the blood. The pathology of latent infections is summed up by the statement that before any clinical symptoms are present the plasmodia are undergoing normal schizogenesis within the spleen, and can be demonstrated within that organ either by splenic puncture or at autopsy; the lesions produced are the same in character as those occurring in acute infections, but less extensive. The author concludes that the greatest hope of success in combating malaria in the Philippines lies in the distribution of quinin to the natives rather than by attempting to exterminate the anopheles mosquito. From observations on recurrence of malarial attacks the conclusion is drawn that when quinin is given as a prophylactic once a week after the initial attack relapses in estivo-autumnal infections occur most frequently between the twentieth and fortieth days, and in tertian infections between the fifteenth and twenty-second days. During these periods of relapse quinin should be given in full therapeutic doses and increased to the point of cinchonism at the appearance of the first symptoms indicative of a malarial attack. The cause of latency is considered to be a conjugation within the red blood cell of two young amebula; and recurrences are thought to be produced by a later liberation and subsequent sporulation of young plasmodia. The author believes that there is both a tertian and quotidian variety of the estivo-autumnal parasite.

39. The principal points in this article were covered in the preliminary note which appeared in THE JOURNAL, Oct. 6, 1906.

Pennsylvania Medical Journal, Athens.

December.

40 *Pathology of the Thyroid Gland. G. P. Müller, Philadelphia.
41 *Etiology of Diseases of the Thyroid Gland, with Special Consideration of Cretinism and Myxedema. T. J. Elterich, Pittsburg.
41½ Surgery of the Thyroid Gland. R. G. Le Conte, Philadelphia.
42 *Diagnosis and Medical Treatment of Exophthalmic Goiter and Hyperthyroidism. A. Stengel, Philadelphia.
43 *Relation Between the Thyroid and the Eye. J. E. Weeks, New York.
44 The Secretary of a County Medical Society. J. F. Donaldson, Canonsburg.
45 Adulteration of Drugs, and Other Subjects Relating to the Profession. J. L. Ziegler, Mount Joy.
46 Simple Elixir as a Vehicle in Prescriptions Intended for Children. E. F. Heffner, Lock Haven.

40.—See abstract in THE JOURNAL, Oct. 13, 1906, p. 1221.

41, 42, 53. **Id.**—Oct. 6, 1906, p. 1131.

Medical Age, Detroit.

December 25.

47 Puerperal Eclampsia. B. A. Allan, Louisville.
48 Practical Consideration of Sexual Assault. C. C. Mapes, Covington.

Wisconsin Medical Journal, Milwaukee.

December.

49 Pneumonia. J. Noer, Stoughton.
50 Syphilis Treated by Intravenous Injections of Mercury. W. F. Bernart, Chicago.
51 Spina Bifida. M. M. Spitz, Milwaukee.
52 Benefits of Modern Therapeutics. S. R. Moyer, Monroe, Wis.

Central States Medical Monitor, Indianapolis.

December.

53 Plea for More Frequent Use of the Ophthalmoscope by the General Practitioner as an Aid in Diagnosis. S. C. Norris, Anderson.
54 Three Cases of Congestion of the Prostate with Functional Disturbances Due to Anal and Peri-anal Irritation. J. E. Morrow, Indianapolis.
55 Hypernutrition. J. T. Scott, Indianapolis.
56 Digest of the Surgical Fevers. M. A. Austin, Anderson.
57 Dermatologic Axioms. N. E. Aronstam, Detroit.
58 Reflex in Appendicitis. C. E. Gillespie, Crothersville.

Journal of the Minnesota State Medical Society and the Northwestern Lancet, Minneapolis.

January 15.

59 *Surgical Treatment of Stenosis of Pylorus. J. U. Goodrich, St. Paul.
60 *Stenosis of Pylorus in Infants. W. R. Ramsey, St. Paul.
61 *Three Goiter Cases of Especial Interest. G. Schwyzer, Minneapolis, Minn.

59. **Stenosis of Plyorus.**—Goodrich reports one case in which a gastrojejunostomy was done without a twist. On the fifth day the patient developed an acute enteritis and died in convulsions the same day. The postmortem did not show any evidence of peritonitis.

60. **Id.**—Ramsey gives a complete history of the case reported by Goodrich and reports one additional case. This patient was only two months and five days old when first seen. Operation was advised but the condition of the patient did not permit its performance. The baby collapsed and died soon after. Section of a tumor at the pylorus showed a marked hyperplasia of the circular muscle coat.

61. **Goiter.**—One of the cases reported by Schwyzer was a hemorrhagic goiter in which peristrumitis developed subsequently. The tumor was removed under local anesthesia from the patient, a man, 55 years of age. He made a complete recovery. The second case was one of struma colloides hyperplastica. This tumor, although unusually large, was also removed under local anesthesia. The third case was one of intrathoracic goiter, occurring in a woman, aged 63, who had had the goiter for 36 years. The hyperplastic colloid tumor was removed under local anesthesia. All the patients are alive and well.

The Journal of the Michigan State Medical Society, Detroit.

January.

62 *Recent Developments in Practical Serum Therapy. A. P. Ohlmacher, Detroit.
63 *Serum Treatment of Acute Articular Rheumatism. G. H. Sherman, Detroit.
64 Pathology of Pneumonia. W. Haughey, Battle Creek.
65 Indications for Enucleation of Eye. C. R. Elwood, Menominee.
66 The Curse of Miscarriage to American Women, with Suggestions in the Way of a Remedy. F. J. W. Maguire, Detroit.

62. **Serum Therapy.**—Ohlmacher discusses refined and concentrated antitoxin; antitetanic serum; the utility of antistreptococcus serums; the serum therapy of pneumonia; meningitis and gonorrhea; technic of serum injections; hypersensibility to serum, and the rectal and oral administration of serum. He says that the practice of using rectal injections when the bowel has been emptied by a laxative and flushed, and of diluting the serum with two or more times its bulk of normal salt solution is excellent. He also thinks it not improbable that further clinical experience will confirm the claims of those who habitually give curative serums by the mouth, especially under circumstances in which subcutaneous injection is impossible or in which no special urgency exists.

63. **Serum Treatment of Rheumatism.**—According to Sherman, the results thus far obtained from the serum treatment of acute articular rheumatism are a material shortening of the course of the disease, no relapse into the chronic state, heart complications diminished in frequency, or more often entirely prevented, and chronic cases much improved, with a distinct tendency to complete recovery. The length of time required to effect a recovery varies with the severity of the case and the time the treatment is started. Sherman begins with an initial dose of 20 c.c. of the serum, followed with

10 c.c. every day until the inflammatory condition subsides. In severe cases 20 c.c. may be given every day. A good index as to tolerance of the serum is the amount of local inflammation produced by the serum from the previous injection. If there is considerable inflammation and swelling at the site of injection, the indication is that the patient does not tolerate the serum well. In these cases the serum should be given by rectum. In chronic cases it should be given at intervals of from two to three days, in doses of 10 c.c.

Philippine Journal of Science, Manila.

November.

67 Cultivation and Pathogenesis of Amebas. W. E. Musgrave and M. T. Clegg.
68 *Types of Bacilli of the Dysentery Group. Y. K. Ohno.
69 List of Philippine Culicidæ with Descriptions of Some New Species. C. S. Banks.

68. **Bacilli of Dysentery Group.**—Ohno isolated, collected and identified from several sources 74 strains of dysentery bacilli and found they could not be distinguished from one another either by their morphologic or cultural properties, although minor differences were shown to exist in their fermentative powers and their action toward immune serum. He believes that the results of his study indicate that the great majority of the bacilli which have been isolated during the past few years from cases of acute dysentery must be considered as being the exciting factor of the disturbance. He sees no reason for separating the dysentery bacilli into two distinct groups, the acid and non-acid, as proposed by Lentz, or for designating any bacillus which causes dysentery as a pseudo-dysentery bacillus, according to Kruse.

The Laryngoscope, St. Louis.

December.

70 Tracheobronchoscopy in its Diagnostic and Therapeutic Aspects. G. Killian, Freiburg, Baden.
71 *Examination of Throat in Chronic Systemic Infections. J. L. Goodale.
72 *Choice of Operation in Treatment of Maxillary Sinus Suppuration. W. A. Wells, Washington, D. C.

71. See abstract in THE JOURNAL, Dec. 15, 1906, p. 2036.

72. **Treatment of Maxillary Sinus Suppuration.**—Wells says that although the dental origin of many cases of maxillary sinus suppuration is admitted, this must not be interpreted as justifying operation by way of the alveolar process, but only as demanding that the trouble with the teeth should be corrected. If the mere removal of a tooth makes an opening into the sinus, irrigation may be tentatively practiced through this opening, not using, however, any artificial appliance to maintain a permanent opening. But the alveolar operation should never be done, he declares, as an operation of choice, because it establishes a communication between the mouth and a suppurating cavity, and requires the use of a tube or plug, which is decidedly disadvantageous. The open method of doing the canine fossa operation is likewise to be condemned on much the same grounds. When simple irrigation has failed or is not practicable, the next step should be a large opening in the inferior meatus, with removal of a portion of the inferior turbinate, as described. If this method is employed very few patients will require radical operations. When this is necessary, the sinus should be well exposed through the anterior wall, and curetted, after which the external opening should be closed, the communications previously made with the nose in the inferior meatus being utilized for drainage and subsequent treatment.

Interstate Medical Journal, St. Louis.

January.

73 Internal Medicine. J. S. Meyer.
74 Diagnosis. A. E. Taussig, St. Louis.
75 Surgery. W. Bartlett, St. Louis.
76 Pathology and Bacteriology. C. Fisch, St. Louis.
77 Pediatrics. A. Friedlander, Cincinnati.
78 Ophthalmology. J. Green, Jr., St. Louis.
79 Orthopedic Surgery. N. Allison, St. Louis.

This is the annual medical progress number in which are reviewed the notable advances made during 1906 in the subjects indicated.

Kentucky Medical Journal, Bowling Green.

January.

80 Prognosis and Management of Nephritis. D. O. Hancock, Henderson.
81 Advantages of Life Insurance Examiners Associations. B. J. O'Connor, Louisville.
82 *Early Diagnosis and Treatment of Pulmonary Tuberculosis. W. F. Boggess, Louisville.

82.—See abstract in THE JOURNAL, Oct. 27, 1906, p. 1401.

Journal of Medical Research, Boston.

September.

83 Study of So-called Infectious Lymphosarcoma of Dogs. S. P. Beebe and J. Ewing, New York.
84 *Intravenous Injections of Nicotine and their Effects on the Aorta of Rabbits. I. Adler and O. Hensel, New York.
85 Transmission of Resistance to Diphtheria Toxin by the Female Guinea-Pig to Her Young. J. F. Anderson, Washington, D. C.
86 Simultaneous Transmission of Resistance to Diphtheria Toxin and Hypersusceptibility to Horse Serum by the Female Guinea-pig to Her Young. J. F. Anderson, Washington, D. C.
87 Multiple Myeloma with Involvement of the Orbit. A. Quackenboss and F. H. Verhoeff, New York.
88 Viability of Bacillus Typhosus under Various Conditions. J. M. Wheeler.

84.—See abstract in THE JOURNAL, Dec. 29, 1906, p. 2176.

New Orleans Medical and Surgical Journal.

January.

89 Mitral and Aortic Insufficiency or Regurgitation. E. W. Breazeale, Campti, La.
90 Case of Probable Black Water Fever. J. B. Cummins, Wyatt, and E. M. Dupaquier, New Orleans.
91 Scarlet Fever. R. W. Faulk.
92 Diagnosis and Medical Treatment of Gallstones. A. B. Nelson.
93 Raynaud's Disease and its Treatment with Atropin. A. E. Foster.

The Medical Standard, Chicago.

January.

94 Proctitis. C. J. Drueck, Chicago.
95 Treatment of Gonorrhea in the Male. J. S. Nagel, Chicago.
96 Dr. Fernand Henrotin. N. Senn, Chicago.

Maryland Medical Journal, Baltimore.

January.

97 Contributions to Ophthalmology made by the American Ophthalmological Society During the Last 31 Years. G. M. Gould, Philadelphia.

Medical Fortnightly, St. Louis.

January 10.

98 Colica Mucosa. L. Crummer, Omaha, Neb.
99 Talks to Recent Graduates. A. L. Benedict, Buffalo.
100 Rheumatism in Children. J. S. Gaumer, Fairfield, Ia.
101 Chronic Tonsilitis; Its Significance. C. A. Boice, Washington, Ia.

Canada Lancet, Toronto.

January.

102 St. Mary's Clinic, Rochester, Minn. E. A. Hall, Vancouver, B. C.
103 The Doctor as Expert and Pioneer. C. J. Whitby.
104 Opsonins and Bacterial Vaccines. G. W. Ross, Toronto.
105 The Dignity of Medicine. D. Duckworth, London.

Canadian Practitioner and Review, Toronto.

January.

106 Diagnosis and Treatment of Accidental Hemorrhage. A. H. Wright, Toronto.
107 Phlegmonous Gastritis. C. J. Wagner, Toronto.
108 Pubiotomy. D. J. Evans, Montreal.

Denver Medical Times.

January.

109 Legislation Prescribing Qualifications for License to Practice Medicine. J. W. McCreery, Greeley, Colo.
110 Present Status of Roentgen Therapy. G. H. Stover, Denver.
111 Tonsillectomy vs. Tonsillotomy. W. C. Bane, Denver.
112 The Typhoid State. T. B. Gormly, Windsor, Colo.
113 Bronchiectasis. W. C. Abbott, Chicago.
114 Care and Management of Nervous and Mental Cases. E. M. Brandt, Denver.

Utah Medical Times.

January.

115 Wounds and Injuries of Orbit. L. W. Snow, Salt Lake City.
116 Medical Legislation. F. C. Glift, Provo.

FOREIGN.

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

British Medical Journal, London.

January 12.

1 *Arteriosclerosis. W. P. Herringham.
2 *Pathology and Treatment of Adherent Pericardium. K. F. Wenckbach.
3 *Anomalous Cases of Pernicious Anemia. G. L. Gulland.
4 Poisoned Spines of the Weever Fish (Trachinus Draco). H. M. Evans.
5 Development of Piroplasma Canis in the Tick. S. R. Christophers.

1. **Arteriosclerosis.**—Herringham is convinced that there is a great variety in the metabolism of different persons, and that the diet which is good for one is, quite apart from gastric

indigestion, poison for another. He says that it is not often that a patient's observation of his own symptoms can be accepted without reserve. Chemical analysis should go much further than the mere estimation of calories or of the nitrogenous contents of the ingesta and excreta and that carefully laid observations will often tell more than chemistry can explain. Chronic rheumatism, some forms of headache, and high blood pressure appear to Herringham to be clues of special importance in examining the effects of different forms of proteid.

2. **Adherent Pericardium.**—Wenckebach reports a case of adherent pericardium occurring in a young boy as the result of an exudative pleurisy and pericarditis in which operative intervention produced most excellent results.

3. **Anomalous Pernicious Anemia.**—Among the cases reported by Gulland are the following: Amaurosis; symptoms resembling peripheral neuritis; aphasia; gastrointestinal symptoms; kidney disease masking the pernicious anemia; acute Bright's disease; intercurrent pyemia; long-continued anemia, with acute terminal attack. He emphasizes the fact that pernicious anemia is by no means an uncommon disease, and that many cases are undiagnosed because of the unusual way in which they commence or in which they run their course, and that there is no means of diagnosis except the examination of the blood, which he advises should be made a routine matter in every case.

The Lancet, London.

January 12.

6 Pathology and Treatment of Ocular Complications of Gonorrheal Infection. W. J. McC. Ettles.
7 Substances Favoring and Inhibiting Action of the Hemolysins of Bile and Serum. M. A. Ruffer and M. Crendiropoulo.
8 *Three Stomach Cases from the Physician's Standpoint. W. Russell, Edinburgh.
9 *Paratyphoid Fever in Mauritius. D. B. Spencer and H. E. Staddon.
10 *White-Wine Whey in Infant Feeding. B. E. Myers and G. F. Still.
11 *Sclerodermia and Myositis. J. A. Nixon.
12 Ruptures of the Urethra, Intrapelvic and Perineal. E. Deanesly.
13 *Gallstones in the Appendix. H. A. Lediard.
14 Pneumothorax from Puncture of the Pleura. J. C. F. D. Vaughan.
15 *Treatment of Chronic Sciatica and Similar Forms of Neuritis. J. C. Webb.
16 *Influenzal Meningitis. J. S. C. Douglas.
17 *Persistency of Infection in Scarlet Fever. H. P. Berry.
18 Dermoid Cyst in Ramus of the Jaw. N. J. F. Vazifdar.

8. **Stomach Cases.**—The three cases described by Russell are one of pyloric narrowing with gastric dilatation and ptosis; one of duodenal ulcer and one of malignant disease at the pyloric end of the stomach. The three patients were operated on and made uninterrupted and rapid recoveries.

9. **Paratyphoid Fever.**—Although clinically the case reported by Spencer and Staddon was one very similar to true typhoid, there were some important differences, namely, the sporadic nature of the case, the absence of the marked typhoid state, and the absence of any abdominal symptoms, pathognomonic of true typhoid, such as would be expected in a case lasting over nine weeks. The Widal test was negative.

10. **White-Wine Whey in Infant Feeding.**—Myers and Still are very favorably impressed with the value of sherry-whey or white-wine whey as an infant's food, but state emphatically that like any other food which contains alcohol it should never be given to infants in larger quantities or continued for a longer period than the exigencies of the case require. They have often used it as the only food for a week or ten days, or given at alternative feedings, for two or three weeks. The whey is prepared by heating ten ounces of milk until just boiling, then adding two and one-half ounces of sherry, heating the mixture until it begins to boil up, when it is removed from the fire and allowed to stand a few minutes. The curd is then strained off through muslin. The whey is used when only small quantities of food can be tolerated and when a stimulant is necessary. To an infant six weeks old a tablespoonful can be given every half hour or every three-quarters of an hour, and the amount and interval gradually increased until two ounces are taken every two hours. In exceptional cases they have given three ounces, every three hours, to infants six months old, and even four ounces, every four hours, for two or three days, to an infant twelve months old.

11. **Scleroderma and Myositis.**—Nixon reports four additional cases in which muscular atrophy was accompanied by scleroderma.

13. **Gallstones in Appendix.**—Lediard reports the case of a man who was operated on for an attack of appendicitis. The appendix was found to contain some mucus and eleven small stones, varying in size from that of a pea to that of a large pin-head. These stones were black in color, rather soft and faceted, like gallstones. On examination, they were found to consist of cholesterin and to contain bile pigment.

15. **Treatment of Sciatica.**—The results obtained in the treatment of a number of cases of sciatica with static electricity lead Webb to say that all forms of neuritis or neuralgia, provided they are not due to pressure of tumors or other irremovable causes, are among the most satisfactory of the many cases that can be cured or relieved by this agent.

16. **Influenzal Meningitis.**—Douglas' patient was a female infant, aged 10 months. Death ensued on the sixth day of the disease and the clinical diagnosis was confirmed microscopically.

17. **Persistency of Infection in Scarlet Fever.**—Berry found on investigation that in certain cases of scarlet fever the infection may remain in the patient for as long a time as two months. That is, the patient and not his clothing may spread the disease.

Journal of Tropical Medicine and Hygiene, London.

January 1.

19 Natal Boils. J. F. Elliott.

The Medical Press and Circular, London.

December 12.

20 Defects in Development; Their Significance. F. Warner.
21 *Treatment of Bronchiectasis. E. Ash.
22 Preventive Treatment of Non-Specific Diseases. P. Londe.
23 Treatment of Syphilis by Intramuscular Injections. S. T. Beggs.

December 26.

24 Differential Diagnosis of Typhoid Fever and Appendicitis. F. Lejars.
25 *Hysterectomy for Fibromyoma Under Spinal Analgesia. J. H. Swanton.
26 Fatal Collapse After Prolonged Abdominal Operations. R. H. Hodgson.

January 2.

27 Arterial Plethora as an Early Symptom in Chronic Bright's Disease. J. O'Carroll.
28 *Organic Treatment of Gastrointestinal Affections. G. A. Weill.
29 *Antistreptococcus Serum in Gonorrhoea and Other Infections. J. P. Parkinson.

January 9.

30 Caseous Pneumonia. Professor Debove.
31 Examination for Life Assurance. R. S. Smith.
32 Cerebral Abscess following Acute Mastoiditis. P. T. B. Beale.

21. **Treatment of Bronchiectasis.**—Ash endorses the treatment advocated by Chaplin, which was published in THE JOURNAL, January 26, page 371.

25. **Spinal Analgesia.**—Swanton says that spinal analgesia is likely to prove useful in gynecologic and obstetric cases in which prompt operative interference is required and in which a general anesthetic is contraindicated by the existence of shock.

28. **Organic Treatment of Gastrointestinal Affections.**—The treatment referred to by Weil is that in which lactic-acid germs are transplanted into the intestinal canal, the resulting lactic fermentation combating the disease successfully.

29. **Antistreptococcus Serum in Gonorrhea.**—Parkinson says that although a rational serum treatment can not be employed at present, experience has shown that a considerable proportion of these cases yield rapidly to the serum injection in the absence of any other medication.

Glasgow Medical Journal.

January.

33 Plea for the Study of the Deaf Child and for the Teaching of Speech to the Semi-deaf and Semi-mute. (Part II). J. K. Love.
34 Operations for Deviation of the Nasal Septum With Special Reference to Submucous Resection. J. Macintyre.
35 *Some Curious Bodies Found in the Female Bladder. A. G. Faulds, Glasgow.
36 Congenital Dislocation of the Patella. A. MacLennan, Glasgow.
37 Address to Glasgow Eastern Medical Society. W. Findlay.

35. **Foreign Bodies in Female Bladder.**—In one case reported

by Faulds a large calculus was found in the bladder, in the center of which there was a gold ring. In another instance a small silver coin had been pushed into the bladder through the urethra. In a third case a small brass bell, such as is often attached to dolls, formed the nucleus of a calculus. In four other cases a piece of copper, the end of a hat pin, a small piece of slate pencil and a pea were found in the bladder. In all of these cases the onset of a cystitis was the symptom which brought the patient for treatment.

Bristol Medico-Chirurgical Journal.

December.

38 X-Ray Therapeutics. J. Taylor.
39 Fibroma of the Abdominal Wall. J. L. Firth.
40 *Preservation of the Limb in Treatment of Sarcoma of the Bone. C. A. Morton.
41 Proteins and Protein Metabolism. J. M. Fortescue-Brickdale.
42 Dermatitis from Without and Dermatitis from Within. A. J. Harrison.

40. **Sarcoma of Bone.**—Morton reports a case in which the upper half of the fibula was excised for periosteal sarcoma. The tumor was completely encapsulated, except at its attachment to the bone. The patient made a good recovery, but has had two recurrences, one eight months after the operation, and the other fourteen months after. The leg was not amputated, every effort having been made to save it.

Dublin Journal of Medical Science.

43 Catalysis and some of its Applications to the Arts and Medicine. W. G. Smith.
44 *Complications Arising in 550 Cases of Scarlet Fever. R. P. Beatty.

44. **Complications of Scarlet Fever.**—Among the 550 cases studied by Beatty, the mortality was only 2 per cent. One patient died from whooping cough; three patients died from nephritis; one from bronchopneumonia; one from general septicemia and enteritis. There were 89 cases of albuminuria, 25 of these developing during the acute febrile stage; 17 cases of nephritis; 1 case of laryngitis; 122 cases of rhinitis; 2 cases of vulvitis; 38 cases of otorrhea; 5 cases each of pneumonia and bronchitis, and 16 patients complained of joint pains. Endocarditis occurred in 7 cases, pericarditis in 1, and stomatitis in 4. In six instances a surgical operation had preceded the attack of scarlet fever.

Presse Médicale, Paris.

45 (XIV, Nos. 103-4, Pp. 821-836.) Pathologic Cytology of the Kidney in Experimental Intoxication with Corrosive Sublimate. (Intoxication exp. avec le sublimé.) G. Mouriquand and A. Policard.
46 *Etiology of Tuberculosis in Infants. (Etiologie de la tub. inf.) A. Calmette.
47 Metallic Mercury in Suspension in Liquid Petrolatum Oil in Treatment of Syphilis. (Injections d' huile grise dans le traitement de la syph.) E. Bodin.
48 Pernicious Anemia of Syphilitic Origin. (Anémie pern. d'origine syph.) M. Labbé.
49 *Vaccination Against Tuberculosis. (Vacc. antitub.) S. Grigoroff.
50 *Lannelongue's Technic for Colpoperineorrhaphy. (Procédé nouveau de colpo-périneorrhaphie.) J. Duvergey.

46. **Etiology and Prevention of Infantile Tuberculosis.**—Calmette remarks that the mesenteric glands in children are actual filters and that only fresh infection recurring again and again at short intervals is able to overcome this natural barrier. Whatever the mode of entrance of the bacilli, the first tuberculous lesion, he affirms, is always vascular. If inhalation were the most common mode of infection, lesions in the lungs and larynx would be much more prevalent among children. Whenever the bacilli enter by way of the skin, mucosa or air passages, there must have been some pre-existing lesion at the point. Referring to the frequency of bovine tuberculosis in man, he states that physicians in the Morlaix region, where bovine tuberculosis is common, have informed him of many cases in which every child in a farmer's family developed tuberculosis, although none of the parents or other relatives seems to be affected. He reiterates his former assertions in regard to the intestinal origin of tuberculosis, pointing out that this does not necessarily mean infection by the food. The bacilli get into the alimentary canal in various ways. He urges others to make a practice of inoculating guinea-pigs with the mesenteric and mediastinal lymph nodes of children succumbing to pulmonary affections of all kinds. He is confident that they will find the mesenteric nodes affected by tubercle bacilli in nearly every instance. He has witnessed again and again that anthracosis develops in the lungs of children or young animals with great facility when inoculation tests show that the lymph glands are already tuberculous, while the particles of charcoal do not reach the lungs in the young when the mesenteric nodes are sound. The milk from suspected cows should be boiled and the lungs of children should be protected against dust, but, first of all, physicians should educate families to know that it is possible to avoid all contagion by simple observance of the most scrupulous cleanliness. The tubercle bacilli are generally introduced into the organism by way of the alimentary canal, in saliva or on contaminated articles of food. The principal sources of contagion are the soiled handkerchief, kisses, the creeping of the child on the floor and its habit of putting everything into its mouth.

49. **Vaccination Against Tuberculosis.**—Grigoroff reports experiences which seem promising for vaccination of human beings against tuberculosis and which he urges others to control. His aim was to destroy the resistant envelope of the tubercle bacillus by diastases derived from saprophytic microbes. He found the amylobacter admirably adapted for the purpose, and relates that living or dead tubercle bacilli treated with cultures of the amylobacter become disintegrated so that they readily succumb to phagocytosis. Tubercle bacilli thus treated presented both a curative and a preventive action in experiments on guinea-pigs and rabbits. The action of the amylobacter is enhanced and the cultures do not degenerate when it is accompanied by its frequent natural associate, the butylic bacillus. The amylobacter is the microbe which produces the fermentation of cellulose. It is cultivated in bouillon containing 10 per cent. dead tubercle bacilli, kept at a temperature of 37 C. for three weeks, filtered through paper and sterilized at 110 C. for fifteen minutes. If the culture then does not contain the butylic bacillus he adds it from a fermentation of butylic alcohol. He obtains the amylobacter by exposing slices of potato in a vessel of water at a temperature of about 19 C. until spontaneous fermentation occurs. His experiences demonstrate that the vaccine thus prepared has a marked curative and preventive action in guinea-pigs. Three weeks after the injection of the infecting bacilli and in spontaneous tuberculosis, injection of the vaccine never failed to arrest the course of the infection.

50. **Lannelonge's Technic for Colpoperineorrhaphy.**—Duvergey gives an illustrated description of the technic which Lannelongue has been using for fifteen years. Twenty-six of the patients thus operated on from three to twelve years ago have been re-examined recently, and the functional and anatomic results have been found perfect, without any tendency to prolapse of the genital organs. A rectangular flap is cut in the mucosa of the posterior wall of the vagina directly on the median line, the retractor, from 3 to 5 cm. wide, serving as a guide, the base of the flap being as far in the posterior cul-de-sac as possible. Three stitches are then taken and tied under the raised flap, and then the base of the flap is cut across and the rectangular defect left is sutured its entire length with catgut. The transverse incision representing the top of the flap is drawn lengthwise and sutured in the same line as the rest of the defect. This reduces the size of the vulva, while affording a support for the perineum.

Semaine Médicale, Paris.

51 (XXVII, No. 1, Pp. 1-12.) *Puerperal Autoinfection from Clinical Standpoint. (Auto-inf. puerpérale au point de vue clinique.) R. de Bovis.
52 (No. 2, Pp. 13-24.) *Miliary Fever. (Nature et contagiosité de la suette miliaire.) A. Vignol.
53 *Pyemia with Mild Course. (Ce qu'on appelle pyohémies atténuées.) F. Lejars.

51. **Puerperal Autoinfection.**—De Bovis reviews a number of recent articles on this subject, the practical conclusions being that it is very important to study the "soil" in each individual case. By so doing unpleasant surprises will be avoided and may even be obviated in a certain measure. Whenever the woman exhibits anything suspicious in her present or past, asepsis should be more scrupulous and intragenital examination should be avoided or restricted to the minimum, to prevent adding the slightest risk of infection to those to which she is already exposed.

52. **Lessons Learned from Recent Epidemic of Miliary Fever.**—Vignol states that after fourteen years of freedom, an epidemic of miliary fever developed in the Charente region this year, study of which seems to show that the disease is subsidiary to measles. The coincidence of measles has been noted in 11 large epidemics, and the outbreak of the epidemic followed a county fair or other large public gathering in every instance. About 6,256 cases were recorded in the recent epidemic, with a mortality of 2 per cent. More than 1,500 houses were officially disinfected, but this did not seem to have any influence on the epidemic, although it may prevent recurrence of the disease. During epidemics of measles, he declares that physicians should be on the lookout for the transformation of the measles into miliary fever and thus detect it in its incipiency.

53. **Attenuated Pyemia.**—Lejars describes some cases of general staphylococcus infection resulting from some trifling injury to a finger. In one case a young man had a number of extensive abscesses at various points, shoulder, appendix, lung, at intervals of several weeks, with complete recovery under operative treatment and no recurrences for more than a year to date. The immediate prognosis of this "attenuated pyemia" is grave, but with prompt operative treatment of the abscesses as they develop the outcome is favorable. The agent, the virulence and the gravity of the multiple abscesses are liable to vary with each case, and no anatomic connection between them and the zone of inoculation is apparent, but they are all evidently due to the same original process, frequently unrecognized. An effectual serum, Lejars says, would be a useful aid in treatment.

Archiv f. Gynäkologie, Berlin.

54 (LXXX, No. 2, Pp. 237-438.) Motor and Inhibiting Nerves of the Uterus. (Bewegungs- und Hemmungsnerven des Ut.) L. Fellner.
55 Sclerosis of the Uterine and Ovarian Vessels from Pregnancy, Menstruation and Ovulation. (Graviditäts-, etc. Sklerose der Uterus- und Ov.-Gefässe.) Pankow.
56 Retention of Fetal Membrane by Fibroma. (Eihautretention am submucösen Fibrom.) J. Krebs.
57 Experimental Demonstration that Narcotic Drugs do not Exert a Paralyzing Influence on the Contractions of the Uterus. (Nark. Mittel und Uteruscontraction.) E. M. Kurdinowski.
58 Decidual Formations in the Ovaries with Pregnancy. (Decid. Bildungen in den Ovarien bei intrauteriner Gravidität.) K. Hörmann.
59 *Functioning of Ovaries Left After Hysterectomy and Their Relation to the Postoperative Menopause Symptoms. (Function der zurückgelassenen Ovarien.) E. Holzbach.
60 *Menstrual Exfoliating Endometritis. (Endometritis exfoliativa menstrualis.) S. Aschheim.
61 Histology of Pregnancy in Rudimentary Cornu. (Hist. der Schwangerschaft im rud. Nebenhorn.) J. Hoff.
62 Coagulation of Blood During Menstruation. (Gerinnung des Blutes während der Menst.) R. Birnbaum and A. Osten.
63 *Primary Tubal Cancer, and Metastases in Tubes from Uterine Cancer. (2 Fälle von prim. Tubencarc.) R. Kundrat.
64 *Influence of Trauma on Continuance of Pregnancy. (Die prognostische Bedeutung operativer und anderer Traumen für die Fortdauer der Schwangerschaft.) M. Neu.
65 *Operations for Recurrences of Uterine Carcinoma. (Ut.-Carc.-Recidiven.) K. Franz.

59. **Functioning of Ovaries Left After Removal of Uterus.**—Holzbach summarizes 3 cases that have been published and reports another in which the ovaries were re-examined years after removal of the uterus for cancer. In every instance the findings showed the presence of an adequate amount of ovarian tissue, capable of functioning, although there was more or less degeneration of some of the vessels. He concludes from study of these cases and from other clinical experience that the ovaries should be left when the uterus is removed, unless their removal is directly indicated. If symptoms of ovarian insufficiency develop afterward the anatomic findings compel the assumption that the cause of the disturbances does not lie in the ovaries themselves. The reciprocal relations between the various organs of the female genital tract are more extensive, he thinks, than is generally accepted to date. Changes in the nervous apparatus of the pelvis are probably responsible for many of the disturbances generally attributed to the supposed missing ovarian function. The 4 cases described were distinguished by the severity of the symptoms of the premature menopause after the hysterectomy, notwithstanding the presence of plenty of functionally capable ovarian tissue.

60. **Menstrual Exfoliating Endometritis.**—Aschheim describes 7 cases, the findings showing the difficulty at times of distinguishing between dysmenorrheic membranes and expelled decidua from an intrauterine or extrauterine pregnancy. The dysmenorrheic membranes are the products of an acute endometritis with effusion, occurring at the time of the menses. The affection has been called decidua menstrualis, membranous dysmenorrhea, and exfoliative endometritis. The cause seems to be some irritation of the uterine mucosa at the time of the menses, the nature of which is still unknown. The patients frequently regard the expulsion of the membranes as a normal feature of menstruation, and do not mention it except on direct inquiry. The expulsion of the membranes and pain during menstruation are the principal features. The membrane formation may follow years of simple dysmenorrhea, and the affection is observed in virgins as well as in married women. The latter frequently complain of sterility. A pregnancy is liable to cure the affection, or it may persist unmodified. Bacteriologic examination was always negative in his cases. The prognosis for a permanent cure is bad, but temporary improvement is generally obtained by appropriate measures, such as curetting, hydrastis, ergot and sedatives internally and hydrotherapy. Even if the expulsion of membranes continues, the patients are satisfied if freed from pain. In the more rebellious cases, he states that cauterization with steam might be tried.

63. **Primary Tubal Cancer and Metastasis in the Tubes with Uterine Cancer.**—The primary carcinoma in the tube in Kundrat's 2 cases accompanied an ovarian cyst, and in one case there was metastasis in the body and cervix of the uterus. Examination of the tubes in 80 cases of carcinoma of the cervix failed to disclose any tendency to cancer in the tubes. On the other hand, in 24 cases of carcinoma of the body of the uterus, metastases were found in the tubes in 2 out of 47 tubes examined.

64. **Prognosis of Operative and Other Trauma for Continuance of Pregnancy.**—Neu relates a number of instances of various traumata and the effect on the pregnancy. In one case severe hemorrhage from a varix in the vulva was followed by the death of the seven-months' fetus. The varix burst during an effort at stool. In another case a couple of cystic nodules in the vagina were excised for examination, followed by severe hemorrhage and the almost immediate death of the fetus. In another case a iii-para with postpartum stenosis of the vagina was operated on at nearly the third month of pregnancy. The cicatricial septum was excised and the circular wound in the vaginal mucosa sutured with catgut, without interfering with the pregnancy. In another case empyema of the gall bladder with diffuse peritonitis, temperature of 40.2 C. and pulse 120, in a ii-para of 29, at the fifth month of pregnancy, required a laparotomy, but the gall bladder was not opened. The incision was merely tamponed at first and sutured later, and the symptoms subsided with normal delivery at term. The diagnosis wavered between empyema of the gall bladder and appendicitis. A gallstone operation became necessary afterward and a stone was found in the common bile duct. The findings at that time indicated that a spontaneous anastomosis between the common bile duct and the duodenum must have followed the previous operation. Extensive adhesions had evidently developed later, and the suppurative cholecystitis must have perforated. Whether this spontaneous cure would have occurred without the incision and tamponing is a question. The fever and icterus vanished and the tumor became smaller soon after the first laparotomy.

65. **Operations for Recurrences of Uterine Carcinoma.**—Franz reports 16 operations for recurrences done on 12 patients. Seven have been free from further recurrence to date. The recurrences were in the wound of the former operation; recurrence in a gland was observed only once. His impression is, further, that the recurrences in the form of nodules are always the result of inoculation during the operation. This was especially apparent in 2 cases in which a nodule in the pelvis accompanied a recurrence in the vaginoperineal incision

or in the abdominal wound. The condition of the rectum and bladder should be investigated before operating on a recurring cancer, and he advises catheterization of the ureters to determine the condition of the kidneys. In one case he was compelled to remove one kidney, and if it had not been that palpation of the other gave unmistakable findings he would have been at a loss, as he had not investigated the condition of the kidneys before attempting the operation. Involvement of the bladder seems less serious to him than involvement of the rectum. Resection of the bladder is less serious and the wound heals more readily than with resection of the rectum. He refrains from operating when he finds the recurring nodule grown to the wall of the pelvis with most of its periphery, as this means that the large vessels are embedded in the cancer, and if they are excised the tissues are left too poorly nourished for primary healing. The ureter is generally involved also in this case.

Berliner klinische Wochenschrift.

66 (XLIII, No. 50, Pp. 1583-1610.) Bladder Stone with Wax Nucleus. Roentgenoscopy for Bladder Stones. (Diagn. Verwendung der Röntgenstrahlen bei Harnkonkrementen.) A. Rothschild.
67 *African Arrow Poisons in Treatment of Cardiac Affections. (Acokanthera Schimperi als Mittel bei Herzkrankheiten.) L. Lewin and E. Stadelmann.
68 *Acquired Forms of Chronic, Acholuric Icterus with Enlargement of Spleen. (Chron. achol. Icterus mit Splenomegalie.) H. Strauss.
69 *Primary Cancer of the Appendix, and Investigation of Appendix at Every Laparotomy. (Prim. Krebs der App.) T. Landau.
70 *Carbonic Oxid and Illuminating Gas Poisoning. (Kohlendunst und Leuchtgas.) T. A. Maass.
71 (No. 51, Pp. 1611-1642.) Experiences with Goiter and Its Treatment. (Kropf und seine Behandlung.) O. Hildebrand.
72 Operative Cure of Tumor of Occipital Lobe. (Tumor des Occ.-Lappens des Gehirns.) H. Oppenheim and F. Krause.
73 Diagnostic Puncture of Brain. (Hirnpunktion.) M. Ascoli.
74 Prophylactic Hemostasis in Osteoplastic Resection of the Skull. (Beitrag zur Hirnchirurgie.) E. Senger.
75 To Make an Elastic Bone Valve in Operating for Epilepsy. Id.
76 Gigantic Renal Calculus. (Ein durch Operation entfernter Riesen-Nieren-Stein.) Johnsen.
77 Contusion of the Abdomen. Two Cases. (Chir. Behandlung der durch stumpfe Gewalt verursachten Unterleibsverletzungen.) A. Stern and T. E. Dolan.
78 Morphin-Scopolamin Anesthesia. (Zur Morph. Scop.-Narkose Korff.) B. Korff.
79 Suction Apparatus for Obtaining Blood for Serodiagnosis. (Modifikation des Bier-Klapp'schen Saugapparates zur Blutgewinnung für sero-diagn. Zwecke.) F. Eichler.
80 Hernias. (Herniologisches.) Lessing.

67. African Arrow Poison in Treatment of Cardiac Affections.—Lewin has been studying certain arrow poisons used in Africa, and has found that the active principle of the Acocanthera schimperi and A. deflersii has a marked action on the heart. It induces much stronger systole, thereby filling the arteries better and raising the blood pressure. Stadelmann relates experiences with it in the clinic which have confirmed the results of experimental and pharmacologic research, demonstrating, he thinks, that it is an effectual heart tonic, worthy to rank with digitalis, acting on the diseased heart in the same way as the latter. The active principle seems to be very durable, as the amount used had been extracted from wood that had been cut for years. In this it has the advantage over digitalis. It has the further advantage that it can be injected subcutaneously without by-effects. The active principle in its crystallized form has been given the name of "ouabain."

68. Acquired Chronic Acholuric Icterus with Enlargement of Spleen.—Strauss describes 2 cases and his treatment, based on the assumed underlying inflammation of the gall bladder. He followed Naunyn's directions for treatment of cholelithiasis, and observed a certain improvement which may, however, have been merely spontaneous remission of the symptoms. The patients were a man and woman of about 26 who had suffered from icterus for years. The spleen was much enlarged and the liver also showed a tendency to enlargement; the stools were brown, and no bilirubin was found in the urine, although urobilin was present. There was also a tendency to gastrointestinal disturbances, obstipation, oppression in the stomach and liver regions, some debility and diarrhea in one case. Both patients suffered from occasional attacks of pain in the liver and stomach region, and one complained of occasional light chills.

69. Primary Cancer of the Appendix.—Landau reports a case in which he was performing a gynecologic operation and casually examined the appendix, as is his invariable custom in all laparotomies for any purpose. He found a primary carcinoma developing unsuspected in the appendix, and expatiates on the fact that a primary cancer in the appendix is not liable to induce any characteristic symptoms for a long time, owing to the anatomic conditions. If symptoms do occur, they are merely those of a chronic, progressive appendicitis. The prognosis with operative treatment seems to be exceptionally good, as no case of recurrence is known, and the progress of the cancer seems unusually slow. In another gynecologic operation the appendix was adherent to the hematoma in a tubal abortion, and was extirpated with the rest. It proved to be inflamed and on the point of perforating. Landau therefore urges every surgeon to examine the appendix as a routine procedure in all abdominal operations, and to remove it without fail if it shows the slightest macroscopic or palpatory findings, or if there is anything in the patient's history to suggest previous trouble in the appendix.

70. Carbonic Oxid and Illuminating Gas Poisoning.—Maass compares the clinical pictures of poisoning from coal gas and from illuminating gas, stating that the symptoms of poisoning from illuminating gas show that it is two and a half times as toxic as pure carbonic oxid. The clinical picture of coal gas poisoning includes coma, dyspnea merging into commencing asphyxia, and frequent twitchings of the body lasting for minutes. Violent convulsions and tetanus are rare, but there are gradually increasing paralysis of the lungs and asphyxia, the blood in general is cherry red, the right heart is gorged with black blood, and finally, there is the carbonic oxid spectrum. With illuminating gas, on the other hand, the tendency to coma is less marked and there is muscular weakness with transient paralysis of the extremities, almost constant general cramps in all cases of a moderate course, with absence of dyspnea, although convulsive respiratory movements occur with expiration. All the organs, especially the brain and meninges, are gorged with red blood showing evidences of toxic action, and there is emphysema of the lungs in the form of circumscribed alveolar emphysema without edema. Recent experimental research on dogs and frogs indicates that the toxic action of illuminating gas must be due in part to some factor aside from the carbonic oxid, as it is so much more toxic than pure carbonic oxid alone.

Deutsches Archiv f. klinische Medizin, Leipsic.

Last indexed XLVII, page 2126.

81 (LXXXIX, Nos. 1-4, Pp. 1-380, *W. Ebstein Festschrift.*) Estimation of Early Symptoms in Appendicitis. (Bewertung der Frühsymptome, etc.) C. Beck.
82 *Operation for a Tumor Between Cerebellum and Pons. (Geschwulst im Kleinhirnbruckenwinkel.) E. Becker.
83 Pathologic Physiology of Gastric Catarrh. (Magenkatarrh.) A. Bickel.
84 *Roentgen Diagnosis of Rare Cardiac Affections. (R.-Diagn. seltener Herzleiden.) T. Deneke.
85 *Clinical History and Significance of Clubbed Fingers. (Trommelschlägelfinger.) E. Ebstein.
86 *"Spontaneous" Rupture of the Stomach. (Magenruptur.) P. Fraenckel.
87 *Importance of Muscles of the Vessels and Their Nerves. (Gerässmuskeln und ihre Nerven.) P. Grützner.
88 *Claims from India for Priority. (Indische Prioritätsansprüche.) J. Jolly.
89 *Rôle of Internal Secretions in Pathogenesis of Diabetes. (Rôle des secr. int. dans la pathogénie du diabète sucré.) R. Lépine.
90 Gout and Psychoses. (Gicht und Psychose.) E. Mendel.
91 Compounds of Uric Acid with Formaldehyd. (Verbindungen der Harnsäure mit Form.) A. Nicolaier.
92 *Paravertebral Area of Dulness on Sound Side of Chest in Case of Pleural Effusion. (Paravertebrale Dämpfung bei Pleuraergüssen.) C. Rauchfuss.
93 Metabolism in Experimental Anemia. (Stoffwechseluntersuchungen bei exp. Anämie.) F. Samuely.
94 Nuclein Metabolism. (Nucleinstoffwechsel.) A. Schittenhelm.
95 Heart Block in Man. (Herzblock.) E. Schreiber.
96 *Form of Tetany Suggesting Acute Myositis. (Arthrogryposis.) Tintemann.
97 *Diphtheria as Epidemic Disease and Its Prophylaxis. (Diphtherie als Volksseuche und ihre Bekämpfung.) Tjaden.
98 *Mishaps in Thoracentesis. (Zwischenfälle bei der Thor., speziell über das Wesen der albuminosen Expektoration.) Waldvogel.
99 *Pathogenesis of Obesity. (Fettsucht.) Id.
100 Percussion and Auscultation of Infants and Symptoms of Pulmonary Tuberculosis During First Year of Life. (Perkussion und Auskultation der Säuglinge.) O. Wyss.
101 *List of W. Ebstein's Works. 1859-1906.

82. **Tumor Between Cerebellum and Pons.**—Becker's patient was a robust man of 36, of a healthy family, who had suffered for six months from occipital headache, deafness and tinnitus in the left ear and uncertain gait, with occasional vertigo and falling, and still more rarely, vomiting. Visual disturbances developed later, with choked disc in each eye and left trigeminal neuralgia. A fibroma was found at the junction of the pons and cerebellum, originating in the auditory nerve. There was considerable venous hemorrhage as it was removed, and during the efforts to arrest the hemorrhage respiration and heart action suddenly ceased. The cavity was tamponed, the skin sutured in a moment, and under artificial respiration and other measures the patient revived. When the pulse and respiration were good again, the provisional suture was cut and the tampon loosened, when the blood again started to flow, but was controlled by compression from without, and the skin was sutured. The patient aroused from the anesthesia, groaned and struggled, but did not regain complete consciousness, and died in less than three hours. Becker reviews the various similar cases that have been reported and the technic of operative treatment, urging the necessity for early surgical intervention. Experience has shown that when the removal of the tumor is not possible, the opening of the skull is liable to have a marked beneficial effect on the general symptoms. The headache and vomiting cease and the choked disc retrogresses, thus preventing the development of optic neuritis with consequent blindness. He cites Cushing's favorable experience in this line. Sänger recommends palliative trephining as a routine measure for every case of inoperable brain tumors. It immeasurably improved 10 of his 11 patients in this class, and Sick has reported permanent restoration of the earning capacity in 3 out of 27. Becker concludes, therefore, that the patient has only to gain from operative treatment whether it removes entirely the lesion causing the disturbances, or merely mitigates the symptoms.

84. **Roentgen Diagnosis of Rare Cardiac Affections.**—Deneke describes a case of Adams-Stokes' disease, and also a congenital heart defect—a single ventricle and two auricles—with postmortem findings in each case. In the first the disturbed coördination between the auricle and the ventricle was rendered visible by Roentgenoscopy, as also the peculiarities of the contractions of the ventricles and auricles under these conditions. The diagnosis of heart block was clear and its mechanism was shown unmistakably in this way.

85. **Clubbing of the Fingers.**—Ebstein traces the history of drumstick fingers and the various affections in which they have been observed. The list is a long one, including affections entailing suppuration and purulent destructive processes, such as tuberculosis with cavity formation, bronchiectasia, empyema, cysto-pyelonephritis and dysentery, infections and chronic intoxications, cardiac defects, especially the congenital, malignant tumors, sarcoma or carcinoma of the lung and sarcoma of the parotid gland and affections of the nervous system, such as syringomyelia and possibly neuritis. Nearly 8 pages are devoted to the bibliography on the subject, the final conclusion being a quotation from West to the effect that clubbing is one of those phenomena with which we are all so familiar that we appear to know more about it than we really do.

86. **"Spontaneous" Rupture of the Stomach.**—Fraenckel concludes his study of the resisting power of the human stomach walls with the statement that great force is necessary to induce perforation or to rupture the wall of the human stomach. With stomach tube and funnel alone he was never able to accomplish it even on the stomach of a new-born infant. He adds further that in the 2 clinical cases on record of rupture of the stomach during lavage, the patients were both suffering from severe morphin intoxication. The rupture in both these cases was multiple.

87. **Importance of Muscles of the Vessels and Their Nerves.**—Grützner presents arguments to prove that the arteries and even the capillaries and the veins possess an innervated musculature which renders them practically accessory hearts, reenforcing the action of the heart and controlling the distribution of the blood.

88. **Medicine in Ancient India.**—Jolly comments on several claims for priority advanced on behalf of ancient Indian medicine. It is claimed that cowpox vaccination was known in ancient India, and that the mosquito transmission of malaria was described in the Sanskrit writings. He has examined these claims and here demonstrates their lack of foundation, the matters referred to in the ancient writings being entirely different, he declares, from the modern discoveries.

89. **Internal Secretions in Origin of Diabetes.**—Lépine reviews the nature and action of internal secretion of the pancreas, thyroid, hypophysis and suprarenal capsule, coming to the conclusion that the internal secretion of the pancreas plays an important part in the pathogenesis of pancreatic diabetes, owing to its importance as a stimulator of general glycolysis. It is probable, he thinks, that in cases in which the functional activity of the pancreas is reduced from any cause, the reduction in the amount of its internal secretion is an accessory factor in the production of a diabetes for which other causes are directly responsible. Other secretions probably exert a more or less important action on the carbohydrate metabolism. This has been experimentally established for some of them, but the clinical data are not sufficient to affirm whether or not they intervene in an effective manner as adjuvant causes of diabetes mellitus. He has recently announced experimental research demonstrating that the glycosuria observed after injection of suprarenal extract occurs with the same characteristics in dogs that have had their pancreas removed as in normal dogs. His experiments prove the existence of a transient suprarenal glycosuria, and suggest the possibility that abnormal functioning of the suprarenals may aid in the production of diabetes in man. This assumption is not sustained by any clinical data to date, and on account of the large amount of suprarenal extract required to induce it and the way in which the system soon becomes accustomed to it, the assumption, he says, does not seem very probable. The influence on glycolysis displayed by the pancreas is not a special function nor due to special elements, such as the islands of Langerhans; it is merely, he thinks, a functional activity which it shares with other organs.

92. **Paravertebral Triangular Area of Dulness on Sound Side with Pleural Effusions.**—Independently of Grocco in Italy, Rauchfuss discovered the diagnostic importance of a triangular area of dulness along the spine on the sound side in case of a pleural effusion, and has been on the lookout for this sign in the clinic for years. He relates 7 typical examples to show its importance under various conditions and the precision with which it parallels the height of the effusion, although not necessarily on a level with it, but varying as the effusion rises and falls. In 77 cases in which it was noted, the dulness was two or three vertebræ lower in about 50 per cent., and in the rest was on the same level, or one or two vertebræ lower. Two cases are related in which the triangular dulness enabled exploratory puncture to be dispensed with; the effusion was a postpneumonic process in one, and occurred in the course of mastoiditis in the other, both puzzling cases. In other cases perforation of an interlobular empyema into the pleural cavity was accompanied by the appearance at once of the triangular area of dulness. The dulness is the result of the displacement of the mediastinum toward the sound side from the encroachment of the effusion. (See also abstract in THE JOURNAL, page 1669, of vol. xliii, 1904, and editorial on page 423 of the current volume.)

96. **Arthrogryposis.**—Tintemann reports a case of this affection which resembles tetany and also acute myositis, but seems to be a distinct morbid entity. A rachitic child of about a year old suddenly exhibited acute fever and tonic contracture of the extremities, which were swollen and apparently very painful. This condition persisted unmodified for several days and then gradually subsided without leaving paralysis. The trouble began in the arms and this fact, together with the involvement of the tongue, suggests a muscular origin, he thinks.

97. **Prophylaxis of Epidemics of Diphtheria.**—Tjaden relates the satisfactory results obtained in Bremen by the coöperation

of the authorities and the public in arresting the spread of diphtheria. Tests as to the ubiquity of the diphtheria germ always resulted negatively Cultures made from the throats of 233 children and 72 adults brought to the hospital for various other affections never revealed the presence of virulent or even weakly virulent diphtheria bacilli. On the other hand, bacilli carriers were frequently encountered in the environment of diphtheria patients. The sick are divided into two classes, those of merely local or family importance and those important for the health of the public, as in case of shopkeeper's family, a teacher or the like. All the inmates of the house in the latter class are examined for bacilli and, when found, the carriers are isolated and the rooms disinfected. The isolation has to be kept up for each carrier until no further cultures develop from their throats and the apartment is disinfected. In cases of the first class, the children of the family are kept away from other children until bacteriologic examination is negative for each. By these moderate and far from perfect measures, the public is being educated to promote instead of rebelling against the prophylactic measures.

98. **Accidents in Thoracentesis.**—Waldvogel writes from Ebstein's clinic at Göttingen to describe a case of hemorrhage and another of albuminous expectoration after puncture for protracted pneumonia with great dyspnea and effacement of the interspaces. The first patient was a child and the trocar pierced the intercostal artery, as the autopsy the next day revealed. The hemorrhage had been spontaneously arrested as the coagulum compressed the wound, the rigid lung not yielding. The first effects of puncture had been apparently beneficial, and it was repeated on the other side the next day. As the aspirated fluid showed traces of blood toward the last, the trocar was withdrawn. In a second case a girl of 17 had been operated on the previous year for a tuberculous process in the scapula. Puncture for a left pleural effusion allowed the escape, without aspiration, of a liter of blood-stained fluid containing much albumin. The effusion required tapping again a week later, the fluid showing the same characteristics. The heart action was bad and the liver spleen and stomach showed much congestion, with ascites, development of a pleural effusion on the other side, and pulse of from 120 to 156. Another puncture, about three months after the first, allowed the escape of about 1.5 liters, without aspiration, of a turbid yellowish fluid. The patient began to cough, and at the change from the sitting to a somewhat reclining posture the cough and dyspnea increased and a foamy, slightly reddish fluid was expectorated. The cyanosis increased and the patient died in twelve hours. The amount of fluid thus expectorated was about 1.5 liters and it contained 3 per cent. albumin. Fully 2 more liters were found in the pleural cavities at autopsy. Experiments on dogs and rabbits are related and the clinical data analyzed to explain the mechanism of these mishaps and means to prevent them. The chief preventive measures are early puncture, prevention of coughing by administration of sedatives, before attempting the puncture, and, finally, stimulation of the heart. The last two measures, he states, should be tried in treatment.

99. **Pathogenesis of Obesity.**—From the same clinic Waldvogel announces that a step has been taken toward the solution of the problem of the origin of obesity in the results of experiments undertaken with injection of 5 gm. of beta-oxybutyric acid extracted from diabetic urine, dissolved in 100 c.c. of water, and injected subcutaneously into the chest. The injections in healthy persons caused always a slight rise in temperature. The oxybutyric acid was completely consumed in the body, and no oxybutyric acid or acetic acid appeared in the urine and the proportion of acetone was not increased. In the obese, on the other hand, no rise in temperature was ever noted, a proof of the slower course of the processes of oxidation in those individuals. The proportion of acetone was also increased on the day following the injection, especially in the breath. For these and other reasons which he enumerates, he regards these tests as demonstrating that the obese are unable to oxidate the fat acids reaching the intermediate metabolism with the same intensity as healthy individuals. The defective transformation of the fat acids leaves an accumulation of the fat in the cells.

101. **Works of W. Ebstein.**—Eleven pages are devoted to the list of articles and monographs published by Ebstein, 1859-1906. They show an amazing range of themes as classified under 20 separate headings. Besides the strictly medical subjects, such as gout, diabetes and other disturbances in metabolism and affections of various viscera, infectious diseases, diagnostics and medical education, there are a number of works showing extensive historical research, "Linnæus as Physician," "Medicine in the Bible and Talmud," "History of the Bubonic Plague," the "Plague of Ancient Greece," etc., and "Quackery in Germany" (1905), and "Medical Experiments and Vivisection" (1906).

Münchener medizinische Wochenschrift.

102 (LIII, No. 50, Pp. 2425-2472.) Experiences with Spinal Anesthesia. (Erfahrungen über Lumbalanästhesie mit Novocain.) R. Henking. Id. O. Steim.
103 Tests of New Formalin Disinfecting Process. (Bakt. Untersuchung über eine neue Formalin-Desinfektionsverfahren, das Autanverfahren.) Selter.
104 Technic of Local Anesthesia. (Zur Tech. der Lokalanästhesie mit bes. Berücksichtigung des Novokain-Suprarenins.) M. Dietze.
105 *Bacteriologic Findings at Autopsy of Typhoid Bacilli Carrier. (Bakt. Bef. bei der Autopsie eines Typhusbazillenträgers.) E. Levy and H. Kayser.
106 Symptoms on Left Side in Appendicitis. (Entstehung linksseitiger Symptome bei Perityphlitis.) L. Burkhardt.
107 Electrotherapy in Circulatory Disturbances. (Elektrotherapie bei Kreislaufstörungen.) Hornung.
108 New Operative Treatment of Glaucoma. (Iridencleisis antiglaucomatosa Holth.) Vollert.
109 Aid in Bacteriologic Examination with the Sedimentation Process. (Hilfsmittel bei Sedimentierungsverfahren.) Sachs-Müke.
110 *Results of Theoretical and Practical Research on Suture Material. (Theor. und Prakt. über unser Fadenmaterial.) Wederhake.
111 (No. 51, Pp. 2517-2564.) Appendicitis. (Zur chir. Behandlung der Perityphlitis und ihrer Folgezustände.) E. Franke.
112 *Immunization of Mice Against Cancer. (Ueber Karzinomimmunität bei Mäusen.) G. Schöne.
113 *Venous Thrombosis and Coagulability of Blood. (Venenthrombose und Gerinnbarkeit des Blutes.) M. Schwab.
114 *Influence of Tropical Sun on Bacteria. (Einfluss der Tropensonne auf pathogene Bakt.) M. Martin.
115 *Silk Ligaments or Arthrodesis in Treatment of Paralytic Flail Joints. (Behandlung paralytischer Schlottergelenke.) M. Herz.
116 Behavior of Agglutinins in Passively Immunized Organism. (Verhalten der Aggl. im passiv imm. Organismus.) E. Pribram.
117 *Neuralgia of the Tongue. (3 Fälle von Zungenneuralgie.) L. Hoefmayr.
118 Mirror Condenser to Render Ultramicroscopic Particles Visible. (Ueber einen neuen Spiegelkondensor zur Sichtbarmachung ultramikr. Teilchen.) C. Reichert.
119 Dangers of a Negative Diagnosis. (Negative Diagnosis.) G. Knauer.
120 Tulle in After-Treatment of Transplanted Flaps. (Tüll bei der Transplantation.) F. Kuhn.
121 Safety Pin for Dressings. (Neue Sicherheitsnadel für Verbandzwecke.) v. Stalewski.
122 Statistics of Gonorrhea. (Zur Statistik der Gonorrhoe.) C. Kopp. Id. R. Kossmann.
123 Infantile Scorbutus. (Möller-Barlowsche Krankheit.) W. Hoffmann and E. Fraenkel.
124 Importance and Application of Physical Methods in Medical Practice. (Physikalische Heilmethoden in der aerztl. Praxis.) O. Vierordt.

105. **Auto-reinfection with Typhoid.**—Levy and Kayser found that a certain insane woman was a "typhoid bacilli carrier," having had typhoid about three years before. She lived thereafter in an isolated apartment and again developed typhoid fever after three years without chance for contagion from without. No symptoms of cholelithiasis had been observed, but autopsy disclosed concrements in the gall bladder, containing numerous typhoid bacilli in their interior.

110. **Silver-Rubber Silk for Sutures.**—Wederhake's description of the suture material used at Witzel's clinic was summarized on page 1517 of the last volume of THE JOURNAL. He here confirms his previous announcements in regard to the superiority of suture material prepared according to the technic described. Tests have demonstrated, he states, that the silver-rubber silk is stronger and more durable than silver wire, while it was always found sterile when removed from the suture later. The finest silver wire is preferred for suturing the skin on account of its greater stiffness. An absorbable silk suture material is also prepared at the clinic, which, on account of its resemblance to parchment, is called parchment

silk. It is prepared by a tanning process, the silk being placed first in concentrated sulphuric acid for from 20 seconds to 4 minutes, then rinsed under running water or with addition of ammonia, then dehydrated in alcohol and placed in "tannin alcohol" for several hours, and then in alcohol for several days. Silk thus prepared is as stiff as fine silver wire, but softens completely when treated with glycerin, and is absorbed in animal tissues in the course of from 3 weeks to 3 months, according to its thickness. The advantages of absorbable silk of this kind are that it can be made from absolutely sterile material, can be sterilized dry at 100 C., or boiled for 10 minutes in a 1 per cent. solution of bichlorid of mercury. It can be kept ready for use in a 1 per thousand bichlorid solution, and has the advantage over catgut that it is more slowly absorbed by the tissues. The treatment with sulphuric acid renders the silk fibers soluble in water, but the tanning process afterward makes them more resistant, so that a longer time is required for their dissolution and absorption. In animal tissues the silk actually dissolves, instead of requiring the action of certain ferments, as is the case with catgut.

112. **Immunization of Mice Against Cancer.**—Schöne's communication issues from Ehrlich's experimental institute at Frankfurt. He announces that he has succeeded in rendering mice immune to epithelial mouse tumors by injecting them with tissues of mouse embryos. Bashford has succeeded in conferring immunity by repeated injection of normal blood and the immunity conferred in these experiments by repeated injection of normal mouse embryonal tissue testifies to the existence of an immunity to mouse carcinoma, which can not be called specific, and which can not be ascribed to the action of parasites or of the products of their metabolism.

113. **Venous Thrombosis and Coagulability of the Blood.**—Schwab states that at Menge's clinic at Erlangen 6 cases of fatal pulmonary embolism have occurred during the last three years, and, with one exception, in women with uterine myoma. The women had not suffered from preceding hemorrhages nor from cardiac defects, and in one case the fatal embolism occurred while the patient was being strengthened for the operation. In the others it occurred after total extirpation by the Doyen technic or by vaginal extirpation of a small myoma. The pulse and temperature charts are appended. They show that absolute bed rest for weeks in case of thrombosis is not an infallible preservative against embolism, and that the behavior of the pulse is not pathognomonic. Study of the coagulability of the blood in 30 patients failed to show any appreciable difference in the time required for the appearance of threads of fibrin in the hanging drop of blood. An interval of less than 4 minutes was never observed, the average being about 5. The longest interval—up to 6 minutes—was noted in patients debilitated by cancer or by thrombosis and long bed rest. The hemoglobin percentage had no influence on the coagulability.

114. **Influence of Tropical Sun on Pathogenic Bacteria.**—Martin relates experiences which demonstrate that most pathogenic varieties of bacteria seem to be destroyed by the bactericidal action of the tropical sun, but that certain nonpathogenic germs do not seem to be affected by it. The mechanical cleansing of the beach by the surf renders the surface of the sand sterile where the surf extends. His experiments did not include anthrax germs, and they were all made on the seacoast.

115. **Surgical Treatment of Paralytic Flail Joints.**—Herz refers to the success obtained by Lange and Reiner with silk ligaments for paralysis—tendon tissue forming around the silk to form a new, strong ligament—and then describes his attempts to apply the same technic in treatment of paralytic flail joints, relics of poliomyelitis. The silk ligatures stretched or worked loose, and in time the condition was nearly as bad as at first. To supplement the silk he therefore had to apply two silver clamps or a silver peg to hold the bones in place. Illustrated descriptions of certain cases thus treated show the details of the technic and the benefits of the metal fixation. Silk ligaments, he thinks, are a beautiful dream. The attempt to apply them in practice has resulted merely in confirming anew the advantages of Albert's method of obliteration of totally paralyzed joints.

117. **Neuralgia of the Tongue.**—Hoeflmayr reports 3 cases and states that the severe neuralgic pains in the tongue were probably the result of chronic obstipation, as they subsided as the intestinal functions were regulated.

Books Received

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

PRACTICAL DIETETICS, With Reference to Diet in Disease, by Alida Frances Patee, Late Instructor in Dietetics, Bellevue Training School for Nurses, Bellevue Hospital, New York City. Fourth Edition. Cloth. Pp. 312. Price, $1.00 net. New York: A. F. Pattee.

DIE SCHMERZPHÄNOMENE Bei Inneren Krankheiten ihre Pathogenese und Differentialdiagnose, by Dr. R. Schmidt, Assistent an der Klinik Hofrat v. Neusser, Wien. Paper. Pp. 332. Leipzig: Wilhelm Braumüller, 1906.

DIE LUNGENSCHWINDSUCHT ihre Ursachen und Bekämpfung. By Dr. O. Burwinkel. Zweite vermehrte und verbesserte Auflage. Paper. Pp. 48. Price, 1 mark. Munich: Aerztlichen Rundschau, 1907.

HAUTPFLEGE UND KOSMETIK, by Dr. G. Michel. Zweite vermehrte und verbesserte Auflage. Paper. Pp. 34. Price, .80 mk. Munich: Aerztlichen Rundschau, 1907.

TWENTIETH ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF OHIO, For the Year Ending Dec. 31, 1905. Cloth. Pp. 501. Springfield: State Printers.

DIE WICHTIGSTEN GRUNDSÄTZE DER KRANKENERNÄHRUNG, by Dr. P. Rodari. Paper. Pp. 17. Price, .60 mk. Munich: Aertzlichen Rundschau, 1907.

PROCEEDINGS OF THE PATHOLOGICAL SOCIETY OF PHILADELPHIA. New Series. Vol. IX. No. 6. Paper. Pp. 161. Philadelphia, 1907.

DIE ENGLISCHE KRANKHEIT und ihre Behandlung, by Dr. W. Goebel. Paper. Pp. 19. Munich: Aerztlichen Rundschau, 1907.

NEW PATENTS.

Recent patents of interest to physicians:

839267. Advertising device for trusses, etc. John W. Bunker, New York.
839268. Support for surgical needles. William R. Burch, Chicago.
839555. Bracing garment. Lula Crumbly, Fort Worth, Texas.
839569. Iodin preparation. Emil Fischer, Berlin, Germany.
839641. Curette. Ethelbert Reavley, Rosthern, Saskatchewan, Can.
839649. Massage and stimulating instrument. Henry J. Roth, New York.
839223. Ankle brace. Calvin M. Stevens, Wheeling, W. Va.
839232. Solution of ferric quinate and albumen. Isidor Traube and R. Wolffenstein, Berlin, Germany.
840285. Truss attachment for corsets. Isidor Baer, New York.
839926. Effecting the destruction of pathogenic organisms in water or other liquids. Patrick G. Griffith, London, England.
840326. Making a solution of oxyhemoglobin. W. J. J. Hendrikszoon, The Hague, Netherlands.
839928. Electric heating attachment for hot-water bags. Charles V. Hill, St. Louis, Mo.
840060. Heating attachment for hot-water bags. Charles V. Hill, St. Louis.
840348. Specialists' chair. Charles N. Leonard, Indianapolis.
840391. Chemical apparatus. Horace B. Snell, Jacksonville, Fla.
840895. Shoulder braces. Charles C. Armstrong, Marysville, Ohio.
840472. Syringe. Robert C. Brookes, Waelder, Texas.
840756. Purifying air. John M. Dieterle, St. Louis.
840560. Vaginal irrigator. Charles O. Farrington and T. Watson, Sealy, Texas.
840931. Casein compound. Byron B. Goldsmith, New York.
840500. Homogenizing emulsions. George Kunick, London, Eng.
841024. Massage-vibrator. Charles N. Leonard, Indianapolis.
840787. Invalid bed. Edward C. Mead, Elkhart, Ind.
840710. Machine for applying capsules to Bottles. Elijah W. Potts Detroit.
840960. Regenerating pasteurizing system. Alban H. Reid, Philadelphia.
840961. Regenerative pasteurizing system. Charles W. Reid, Milford, Del.
840962. Making terpin hydrate. Ludwig H. Reuter, New York.
840868. Electrical distribution and control in body appliances for medical purposes. John F. Richardson, Montreal, Quebec, Can.
841057. Hair tonic. Edward N. Sheldon, Belleville, Kans.
841146. Pneumatic massage apparatus. Sayer Hasbrouck, Providence, R. I.
841190. Manufacture of purified soda-pine pulp. William H. Sharp, Philadelphia.